United States Patent

Lyden

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[54] LUBRICANT MANIFOLD ASSEMBLY

[72] Inventor: **Frank J. Lyden,** Manitowoc, Wis.

[73] Assignee: **Oil-Rite Corporation,** Manitowoc, Wis.

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[52] **U.S. Cl.** .....**184/7 R,** 184/81

[51] **Int. Cl.**.....**F16n 7/06**

[58] **Field of Search**.....138/155; 184/7 C, 81; 141/244

[56] **References Cited**

UNITED STATES PATENTS

2,646,856	7/1953	Lyden	184/81
2,837,174	6/1958	Lyden	184/81
3,078,960	2/1963	Minton	184/7 X

Primary Examiner—Manuel A. Antonakas

Attorney—Andrus, Sceales, Starke & Sawall

[57] **ABSTRACT**

A manifold assembly is disclosed for the distribution of lubricant to a plurality of lubricators. The manifold includes a plurality of blocks arranged in series or in end to end relation longitudinally. Each block is provided with a longitudinally extending bore with the bores of the respective blocks being axially aligned and in communication with each other to form a manifold distribution passage. An inlet to the distribution passage is provided in one of the blocks and an outlet communicating with the distribution passage is provided in each of the blocks. A plurality of lubricators corresponding to the number of blocks are supplied from the distribution passage through corresponding coupling means which are secured in the outlets of the respective blocks and support the lubricators.

7 Claims, 7 Drawing Figures

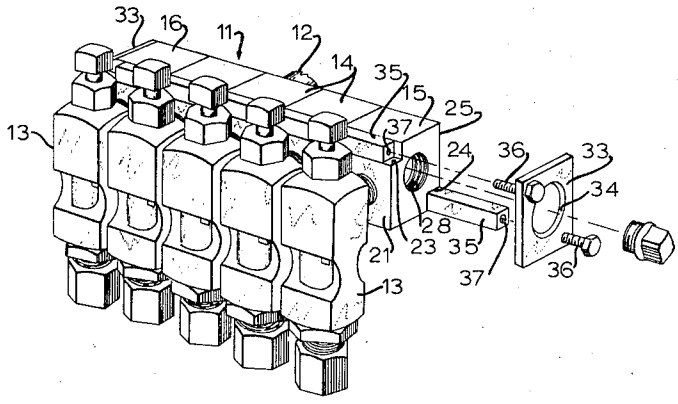


FIG_1

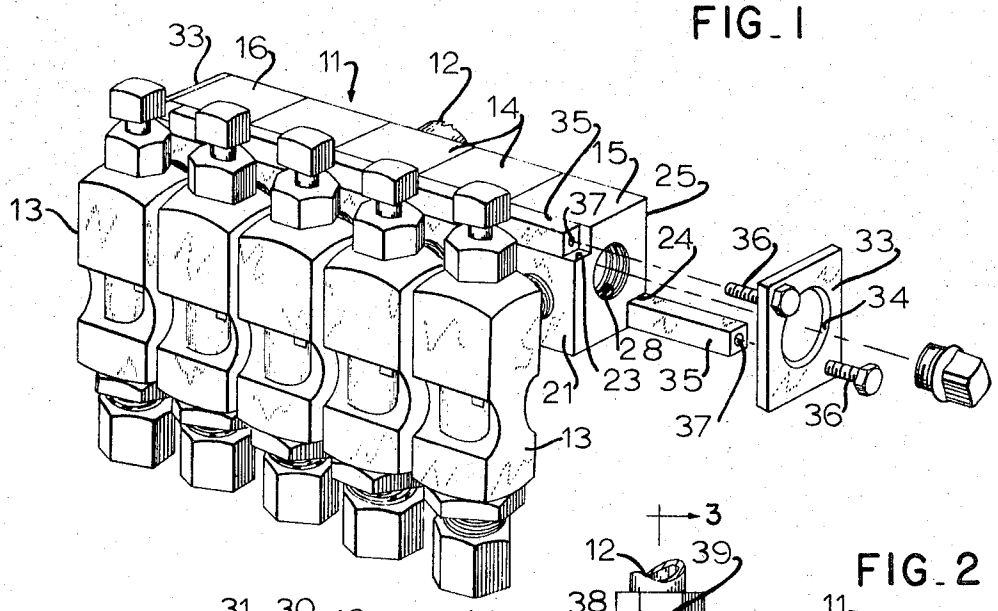


FIG_2

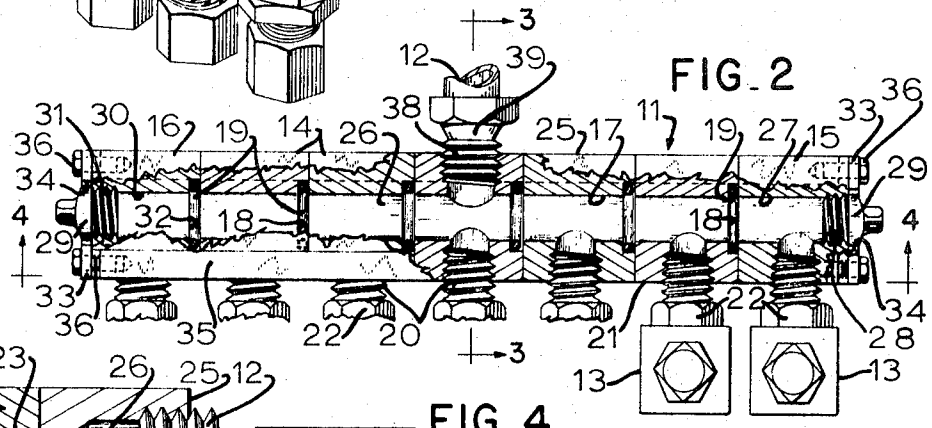


FIG_3

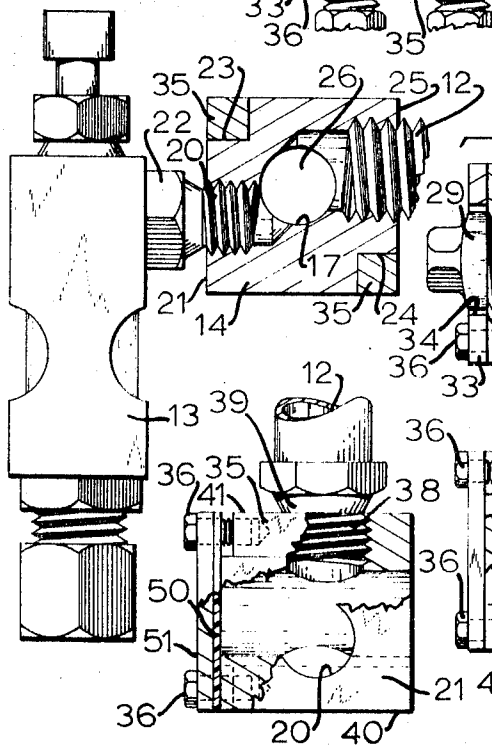


FIG_4

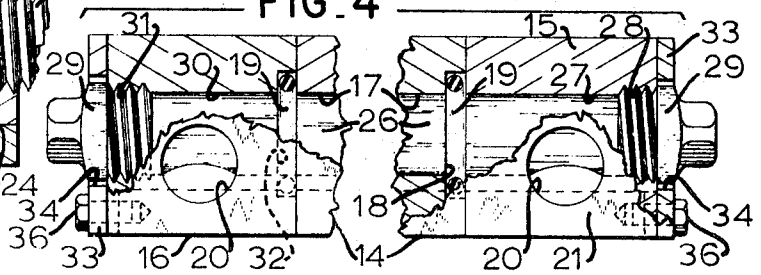


FIG_5

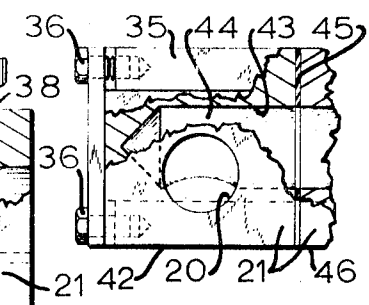


FIG_6

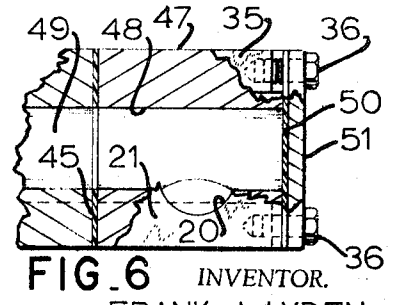


FIG_7

INVENTOR.
FRANK J. LYDEN

BY
Andrus, Sceales, Starke & Sawall
Attorneys

LUBRICANT MANIFOLD ASSEMBLY

BACKGROUND OF THE INVENTION

This invention relates to a lubricant manifold assembly for use with a plurality of lubricators such as sight feed valves.

In one form of gang or multiple lubricators as shown and described in the earlier U.S. Pat. No. 2,646,856 by the instant inventor, a manifold was common or integral with the sight feed valve bodies. In that construction the manifold distribution passage was intercepted and obstructed by the several needle valves. Because of the needle valve restriction on oil flow, only a relatively few valves could be accommodated when oil consumption was fairly high. Also, in the earlier construction, where the inlet was to be brought in centrally of the lubricators, a gap in the valves was required to accommodate the inlet and thus more space was required for the gang mounting. Alignment problems were also common with the earlier construction. Each valve unit required accurate machining relative to the tie rod securement for proper alignment and appearance. Such accuracy proved difficult to attain and as a consequence appearance sometimes had to be sacrificed. It is generally an object of this invention to overcome the noted problems and to provide a more versatile manifold construction.

SUMMARY OF THE INVENTION

According to the invention, a manifold assembly for the distribution of a lubricant to plurality of lubricators comprises a plurality of blocks arranged in series or in end to end relation longitudinally. Each of the blocks is provided with a longitudinally extending bore with the respective bores being axially aligned and in communication with each other to form the manifold distribution passage. An inlet having communication with the distribution passage is provided in one of the blocks. Each block is provided with an outlet communicating with the distribution passage. A plurality of lubricators corresponding to the number of blocks are supplied from the distribution passage through coupling means secured in the outlet of the respective blocks and which support the lubricators.

DRAWING DESCRIPTIONS

The drawings furnished herewith illustrate the best mode presently contemplated and set forth hereinafter for carrying out the invention.

In the drawings:

FIG. 1 is a partially exploded perspective view and shows the manifold structure of this invention with a plurality of sight feed valves connected thereto;

FIG. 2 is a plan view with parts broken away and sectioned showing the manifold structure adapted for an increased number of sight feed valves;

FIG. 3 is an enlarged sectional view taken generally on line 3—3 of FIG. 2 and further shows a sight feed valve added for clarity;

FIG. 4 is an enlarged view taken generally on line 4—4 of FIG. 2 with parts broken away and sectioned;

FIG. 5 is a partial elevational view with parts broken away and sectioned and shows a further form of terminal block;

FIG. 6 is a partial elevational view with parts broken away and sectioned and shows a further embodiment of the invention; and

FIG. 7 is a partial elevational view with parts broken away and sectioned ans shows a further detail of the invention.

DESCRIPTION OF ILLUSTRATED EMBODIMENTS

Referring to the drawings, the manifold **11** of this invention communicates with a lubricant reservoir, not shown through an inlet pipe **12**. The lubricant from the reservoir is distributed by the manifold **11** to a plurality of lubricators such as the sight feed valves **13** for delivery to a plurality of points of application, not shown. The lubricant may flow through the system under the influence of gravity or be force fed by an applied pressure.

The manifold **11** generally comprises a plurality of blocks arranged and assembled in end to end relation or in series longitudinally with each block being adapted to receive a lubricator **13**. As generally shown in FIGS. 1–4 any number of desired intermediate blocks **14** are disposed between the terminal blocks **15** and **16** at the respective end of the manifold.

Each of the blocks **14** is provided with a longitudinally extending through bore **17** generally centrally of the block. At the corresponding end of each block **14** a relatively shallow counterbore **18** is provided generally concentrically with the bore **17**. The respective counterbores **18** are adapted to receive a resilient O-ring **19** having an inside diameter corresponding generally to that of bore **17** and the cross-sectional diameter of which somewhat exceeds the depth of the counterbores. In the manifold assembly, the O-rings are compressed within the counterbores to seal the corresponding joint between the adjacent blocks **14**.

A threaded outlet **20** extends from the forward face **21** of each block **14** generally normal to a vertical plane through the centerline of bore **17**. The outlet **20** communicates with the bore **17** with the center line of the outlet being somewhat beneath the centerline of the bore to provide a natural flow path from the bore into the outlet. A hollow threaded coupling element **22** is adapted to be threaded into the outlet **20** to place the bore **17** in communication with the corresponding lubricator **13** supported from the coupling element. Since the outlets **20** and the corresponding coupling elements **22** are generally transversely aligned, the lubricators **13** are as a consequence similarly aligned.

The forward face **21** of each block **14** is provided with an indentation or recess **23** which extends the entire length of the block adjacent to the upper surface thereof. The recess **23** may be generally square in cross section, as shown, and provides the forward face **21** with a stepped configuration. A similar longitudinally extending recess **24** is provided in the rear face **25** of each block **14** adjacent to the lower surface thereof.

Any desired number of blocks **14** are arranged in series longitudinally with the bores **17** being axially aligned as well as the front and rear faces **21** and **25**, respectively, being similarly aligned and with the counterbores **18** all facing in the same direction. With the blocks **14** so arranged the aligned bores **17** form a part of the manifold distribution passage **26** which communicates with the respective lubricators **13**.

As shown in the drawings, the assembly further includes the opposed terminal blocks **15** and **16** having generally similar cross-sectional dimensions as the blocks **14**. The terminal block **15**, as viewed on the right in FIGS. **2** and **4**, is provided with a longitudinal through bore **27** axially aligned with the bores **17** and having a like diameter. The block **15** further includes at outlet **20** in the front face thereof transversely aligned with the similar outlets in the blocks **14** for reception of a coupling element **22** for support of a lubricator **13**. The outer end of bore **27** is threaded at **28** and is adapted to receive the closure plug **29** forming one terminus for the distribution passage **26**. The joint between the terminal block **15** and the adjacent block **14** is sealed upon assembly by the O-ring **19** provided in the counterbore **18** of the latter block. The block **15** includes the diagonally opposed indentations or recesses **23** and **24** in the front and rear faces **21** and **25** respectively, similarly as in the blocks **14**.

The terminal block **16**, on the left as viewed in FIGS. **2** and **4**, is generally similar to block **15** but of opposite hand. Through bore **30** in block **16** is axially aligned with and of like diameter with the bores **17** and **27** of the blocks **14** and **15**. The outer end of bore **30** is threaded at **31** to receive a closure plug **29** to form the other terminus for the distribution passage **26** of the manifold. A relatively shallow counterbore **32** is provided concentrically with bore **30** to correspond generally with the counterbore **18** in the blocks **14**. An O-ring **19** is disposed in the counterbore **32** to effect a seal at the joint between terminal block **16** and the adjacent block **14**. Block **16** further includes an outlet **20** transversely aligned with the similar outlets in blocks **14** and **15** for receipt of a coupling element **22** and corresponding lubricator **13**.

After the desired number of blocks **14** together with the terminal blocks **15** and **16** are arranged in end to end relation as described, a terminal plate **33** is placed at the respective ends of the assembly outwardly of the terminal blocks. The respective plates **33** are provided with openings **34** which are aligned with and oversize relative to the corresponding threaded bores **27** and **30** in terminal blocks **15** and **16** to provide for passage of the respective closure plugs **29**.

With the blocks **14**, **15** and **16** arranged as described, the indentations or recesses **23** and **24** in the forward and rear faces of the respective blocks are generally aligned and adapted to receive the tie rods **35** having a cross-section generally corresponding to that for the recesses. The respective tie rods **35** are somewhat shorter than the combined length of the aligned blocks **14**, **15** and **16** so that the respective ends of the tie rods remain spaced from the corresponding terminal plates **33**. Screws **36** extend through the respective terminal plates **33** and engage within axially extending threaded openings **37** in the corresponding ends of the tie rods **35** to secure the assembly into an integral unit. As the respective screws **36** are drawn up tight, the respective blocks **14**, **15** and **16** are drawn together to compress the several O-rings **19** and so seal the corresponding joints between the respective blocks against leakage.

The manifold distribution passage **26** is supplied from a lubricant reservoir, not shown, through a threaded inlet **38** adapted for receipt of an inlet fitting **39** and disposed in one of the blocks **14**. In FIGS. **1** through **3** the inlet **38** and its fitting **39** are shown disposed in the rear face **25** of the centermost block **14** of the manifold assembly with the centerline of the inlet being above the centerline of distribution passage **26**. If a particular application permits, the inlet **38** may be eliminated and either of the threaded bores **27** or **30** may serve as the inlet to the distribution passage **26**. FIG. **7** shows another form of block **40** to be further described hereinafter and indicates that, depending on particular applications or desires, the inlet **38** may be placed in the upper surface **41** of a block and even in one of the terminal blocks.

In the embodiment of FIG. **5**, another form of terminal block **42** is shown. In the terminal block **42** the longitudinally extending bore **43** of the manifold distribution passage **44** stops short of the end of the block eliminating any need for closure plug **29**. While a gasket **45** is shown between the terminal block **42** and the adjacent block **46**, the O-ring construction of the earlier figures could be utilized therebetween.

The embodiment of FIG. **6** shows a gasketed construction and presents the further advantage that all of the blocks **47** in the manifold assembly, even those corresponding to the terminal blocks, may be generally similar. The blocks **47** are generally similar to blocks **14** except for the mode of sealing therebetween and each has a longitudinally extending through bore **48** which in assembled relation forms the manifold distribution passage **49**. While apertured gaskets **45** are provided for sealing the joints between adjacent blocks **47**, non-apertured gaskets **50** are preferably used together with an end closure plate **51** having no aperture aligned with passage **49** to seal the ends of the passage. The block **40** of FIG. **7** is generally similar to the blocks **47** except for the additional provision of the inlet **38**.

I claim:

1. In a manifold for the distribution of lubricant, to a plurality of lubricators, a plurality of block-like members corresponding to said lubricators and arranged in series longitudinally to form an assembly, said block-like members each having a longitudinally extending bore generally centrally thereof with the bores of the respective members being disposed in axially aligned relation and in communication with each other to form a manifold distribution passage in the assembly, said block-like members each having longitudinally extending recesses provided along a pair of diagonally opposed edges thereof with the recesses of the respective members being longitudinally aligned over the length of the assembly, and tie rod means disposed in the diagonally opposed and aligned recesses of said series of block-like members for securing the assembly into an integral unit, one of said block-like members having an inlet communicating with the manifold distribution passage and each of said members having an outlet communicating with said passage and receiving a corresponding lubricator, said outlets in the respective block-like members having their centerline disposed beneath the centerline of the manifold distribution passage to place the corresponding lubricators in communication with said manifold passage.

2. In a manifold for the distribution of lubricant, a plurality of lubricators, a plurality of block-like members corresponding to said lubricators and having front, rear, top bottom and opposed end faces and being arranged in series end to end to form a longitudinally extending assembly, said block-like members each having a bore extending end to end and generally centrally thereof with the bores of the respective members being disposed in axially aligned relation and in communication with each other to form a longitudinally extending manifold distribution passage in the assembly, said block-like members each having longitudinally extending recesses provided along the diagonally opposed edges formed between the front and top faces thereof and between the rear and bottom faces thereof with the recesses of the respective members being longitudinally aligned over the length of the assembly, and tie rod means disposed in the diagonally opposed and aligned recesses of said series of block-like members for securing the assembly into an integral unit, one of said block-like members having an inlet in the rear face thereof communicating with the manifold distribution passage, said inlet being disposed above the tie rod means and having a centerline disposed above the centerline of said manifold passage, said members each having an outlet communicating with said manifold distribution passage and receiving a corresponding lubricator, said outlets in the respective block-like members being disposed in the front face thereof beneath the tie rod means and having their centerline disposed beneath the centerline of the manifold distribution passage to place the corresponding lubricators in corresponding lubricators in communication with said manifold passage.

3. In a manifold for the distribution of lubricant, a plurality of lubricators, a plurality of intermediate block-like members arranged in series longitudinally, a pair of terminal block-like members having similar cross-sectional dimensions as the intermediate block-like members and being disposed at the respective ends of the intermediate members to form an assembly having opposed front and rear faces, said intermediate and terminal block-like members together corresponding to said lubricators, said block-like members each having a longitudinally extending bore with the bores of the respective members being axially aligned and in communication with each other to form a manifold distribution passage in the assembly, end closure means for said manifold passage provided at the outer ends of the terminal members, said block-like members each having longitudinally extending recess along the upper edge of the front face and the lower edge of the rear face to provide the assembly with diagonally opposed, longitudinally aligned recesses, and tie rod means disposed in the diagonally opposed recesses of the assembly for securing the assembly into an integral unit, one of said block-like members having an inlet in the rear face thereof communicating with the manifold distribution passage, said inlet being disposed above the tie rod means and having a centerline disposed above the centerline of said manifold passage, said members each having an outlet communicating with said manifold distribution passage and receiving a corresponding lubricator, said outlets in the respective block-like members being disposed in the front face thereof beneath the tie rod means and having their centerline disposed beneath the centerline of the manifold distribution passage to place the corresponding lubricators in communication with said manifold passage.

4. The invention as set forth in claim **3** wherein the bore in said terminal block-like members terminates inside the respective terminal members to form the end closure means for the manifold distribution passage.

5. The invention as set forth in claim 3 wherein the bore in said terminal block like members is a through bore having threaded outer end portions and the end closure means for the manifold distribution passage are plugs adapted to be threaded into said bore end portions.

6. The invention as set forth in claim 3 wherein the bore in said terminal block like members is a through bore and the end enclosure means for the manifold distribution passage are an end plate and a sealing member intermediate the respective terminal members and the corresponding end plate.

7. The invention as set forth in claim 6 wherein the end plates forming the end closure means constitute a part of the tie rod means for securing said block-like members into an integral unit.

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