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AIR CYLINDER OILING

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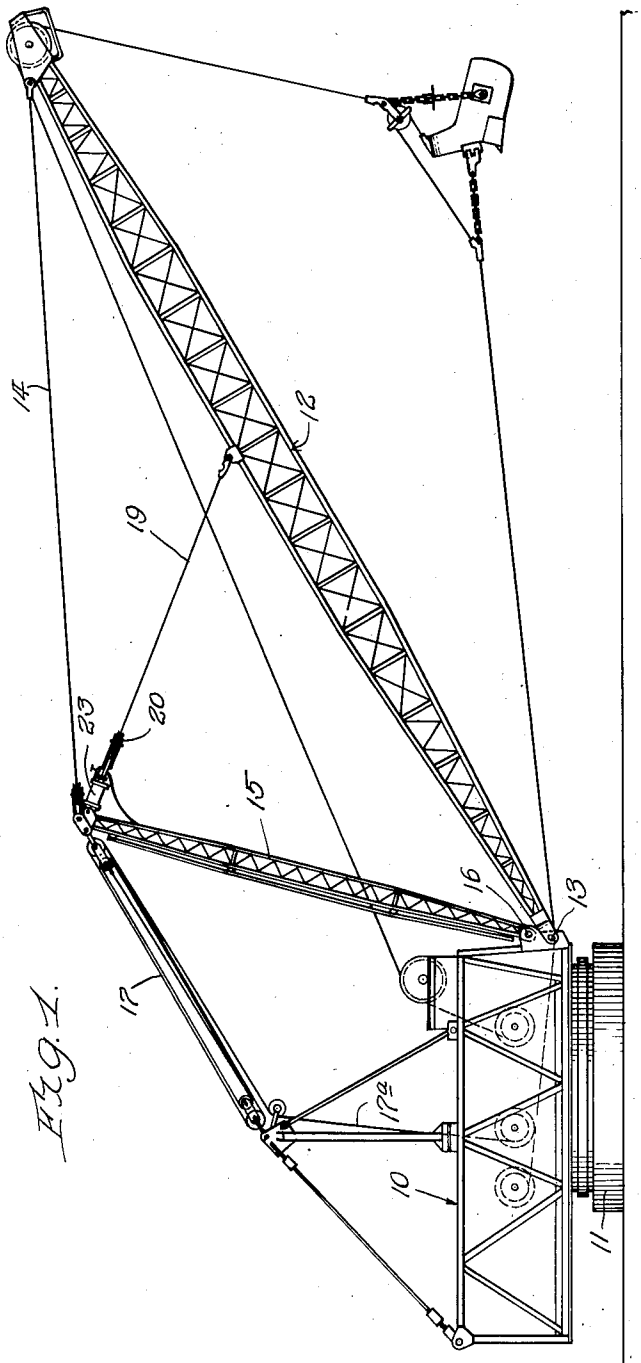


Fig. 1.

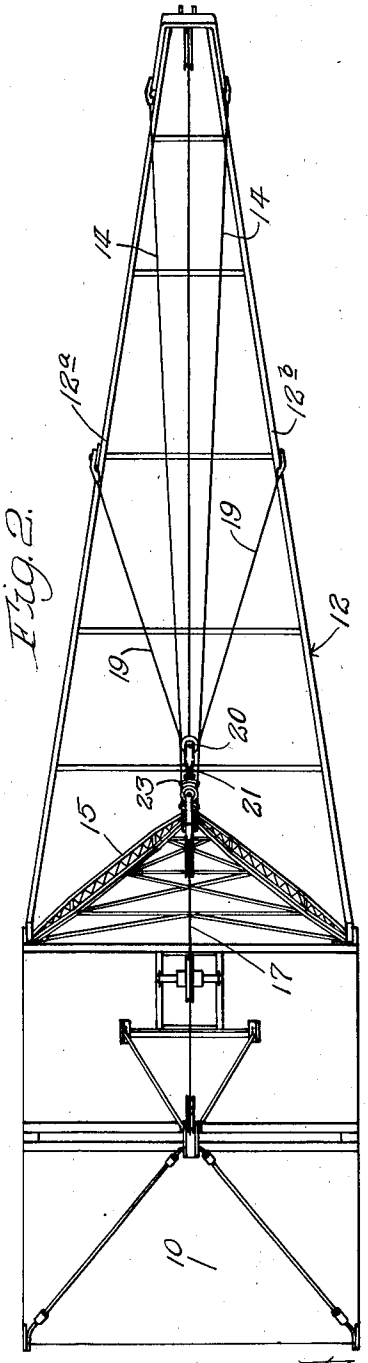


Fig. 2.

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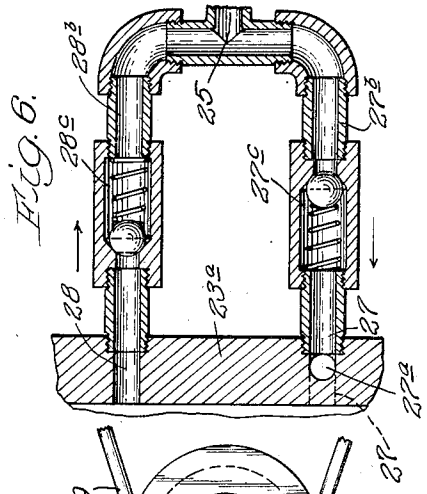


Fig. 6.

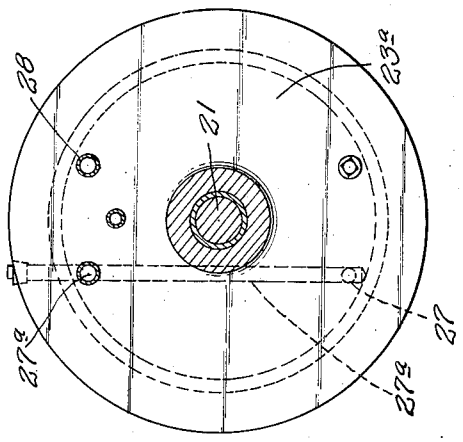


Fig. 5.

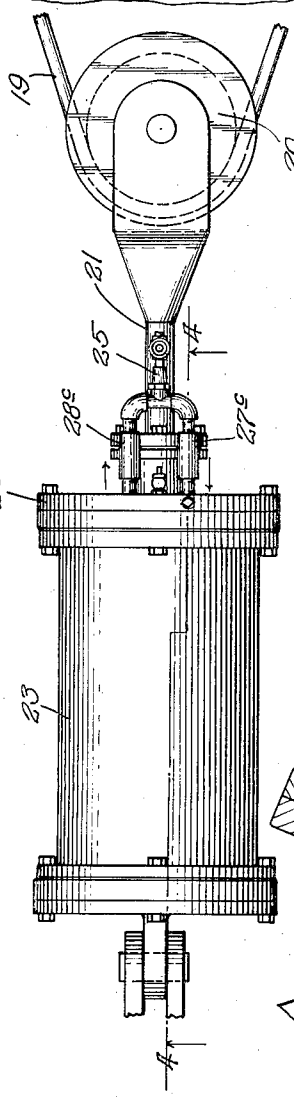


Fig. 3.

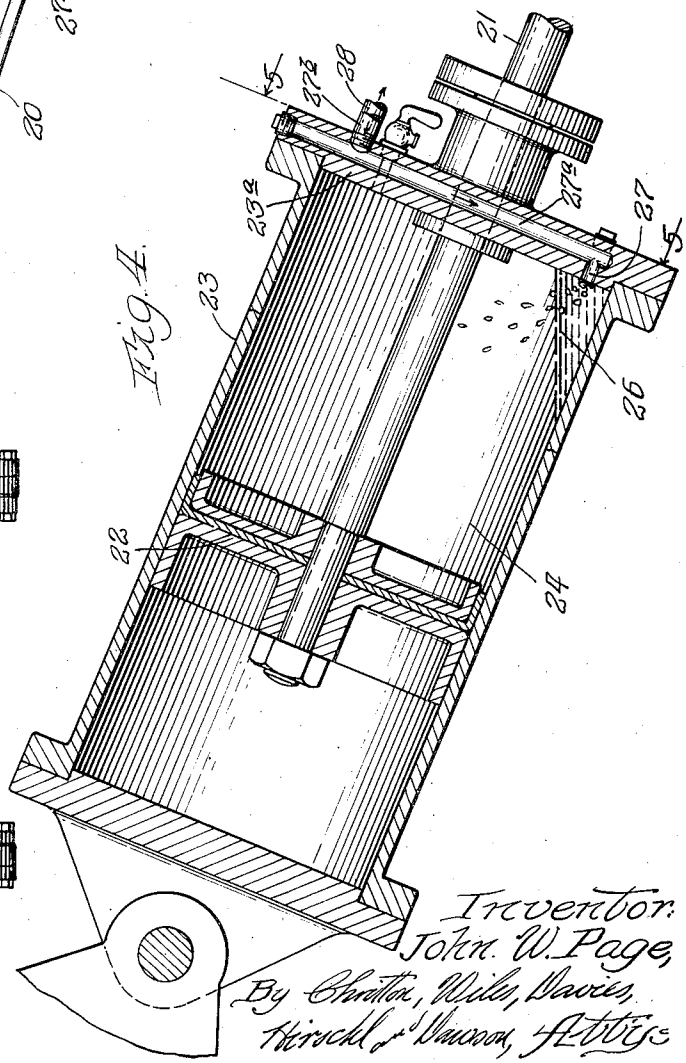


Fig. 4.

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UNITED STATES PATENT OFFICE

2,255,568

AIR CYLINDER OILING

John W. Page, Chicago, Ill., assignor to Page Engineering Company, a corporation of Illinois

Application December 19, 1940, Serial No. 370,887

4 Claims. (Cl. 184—18)

This invention relates to improvements in air cylinders and more especially to an air cylinder adapted for use in connection with mechanism for supporting the intermediate portion of a relatively long heavy boom as is commonly used in derrick construction.

It has been customary heretofore to provide a support for a derrick boom at the center, but where such support was a fixed length difficulty was encountered when the end of the boom changed position. By the use of my invention an extensible and contractible supporting means is provided for the center part of the boom, such means exerting a substantially constant pull in all of its positions.

Another feature of my invention is the provision of means for insuring adequate lubrication of the piston in an air cylinder of the character described.

Other features and advantages of my invention will appear more fully as I proceed with my specification.

In that form of device embodying the features of my invention illustrated in the accompanying drawings, Fig. 1 is a view in side elevation of a derrick showing the complete boom supporting mechanism; Fig. 2 is a top plan view of the same; Fig. 3 is an enlarged top view of the pneumatic cylinder; Fig. 4 is a vertical sectional view of the same; Fig. 5 is a view taken as indicated by the line 5 of Fig. 4; and Fig. 6 is an enlarged diagrammatic view of the air inlet and outlet for the cylinder.

As shown in the drawings, 10 may indicate in general a suitable structure mounted on the base 11 and carrying the boom 12 pivotally attached at 13. The boom is supported at its outer end by means of the fixed line 14 attached to the upper end of the floating mast or A frame 15, the lower end of which is pivoted at 16. The upper end of the A frame 15 is adjustably held by the reeved line 17, the end 17a of which is controlled by suitable winding machinery on the structure 10.

Because of the length of the boom and its weight, it is desirable to provide means for supporting it between the ends. The fixed line 14 will stretch somewhat under load and since the pivots 13 and 16 are not coincident there will be some variation in the distance between the center of the boom and the top of the A frame 15 in ordinary usage. Accordingly, if the supporting means for the central portion of the boom is of fixed length there will be some undesirable bending of the boom. If the supporting means is provided with a spring or equivalent member then the tension or pull of the supporting means will not be constant. The principal feature of my invention is to provide such supporting means for the boom intermediate its ends, that is extensible and contractible, and a means that will exert a substantially constant pull in all its positions. This I shall now describe more in detail.

19 indicates a bridle cable with its ends attached to the side member 12a and 12b of the boom intermediate the ends. As here shown, the attachment is somewhat higher than the middle point. The bridle cable 19 passes over the pulley 20 fastened to the piston rod 21 which in turn carries the piston 22 in the cylinder 23 attached to the upper end of the A frame 15. Fluid pressure is supplied to the cylinder 23 in the space 24 through the pipe 25 by any suitable means (not shown) to maintain a substantially constant pull on the piston rod 21 and thus give a substantially constant support to the boom 12. It is to be understood that the pressure in the space 24 is maintained substantially constant regardless of the position of the piston 22. This can be accomplished in any suitable manner. For example, the space 24 can be connected to a suitable air pressure tank provided with a pump and safety valve so that an adequate supply of air at a constant pressure is always available. It is also possible to supply air at a constant pressure to the space 24 through a pressure-reducing valve of well known construction.

The principal feature of this invention is the provision of means for insuring continuous and positive lubrication to the interior of the cylinder 23 so that the wear on the piston will be reduced to a minimum. In the ordinary operation of this apparatus the center part of the boom 12 will vibrate upwardly and downwardly a great deal. This will cause back and forth movement of the piston 22 in the cylinder. In fact, it will be seen that the piston 22 will be cushioned upon compressed air in the space 24. The piston will vibrate to a great extent on this cushion. Therefore, there will be considerable wear in the cylinder unless adequate lubrication is provided.

In the ordinary use of the device the piston 23 will be on a slight slant as shown in Figs. 1 and 4. I have provided a pool of oil in the low end of the cylinder as indicated by 26 in Fig. 4. 27 indicates an air inlet entering the cylinder below the level of the oil pool. This is connected to a port 27a in the cylinder head 23a which in turn is connected to the inlet pipe 27b, attached to the cylinder head near the upper edge. At one side of the pipe 27b is the outlet pipe 28b

connected to the outlet **28** in the cylinder above the oil level. The pipe **27***b* is provided with a check valve **27***c* permitting air to enter the cylinder only. The pipe **28***b* is provided with a check valve **28***c* permitting air to escape from the cylinder only. The pipes **27***b*, **28***b* and **25** are connected in a **T**.

It will be seen, therefore, that vibrating or pulsating action of the piston **22** in the cylinder will act to cause some movement of air out through the pipe **28***b* and back into the cylinder through the pipe **27***b* and inlet **27**. The latter being under the oil will cause oil to be sprayed up against the walls of the cylinder and against the piston and piston rod, thus insuring adequate lubrication at all times.

While I have shown and described certain embodiments of my invention, it is to be understood that it is capable of many modifications. Changes, therefore, in the construction and arrangement may be made without departing from the spirit and scope of the invention as disclosed in the appended claims, in which it is my intention to claim all novelty inherent in my invention as broadly as permissible, in view of the prior art.

What I claim as new and desire to secure by Letters Patent is:

1. In an air cylinder having a vibrating piston therein, a pool of oil in the cylinder, an air inlet below the oil level, an air outlet, and a connection between the inlet and the outlet.

2. In an air cylinder having a vibrating piston therein, a pool of oil in the cylinder, an air inlet below the oil level, an air outlet above the oil level, and a connection between the inlet and the outlet.

3. A device of the character described, including: a cylinder; a piston therein; a pool of oil in the cylinder; an air inlet entering the cylinder below the level of the oil pool; and an air outlet from the cylinder above the level of the oil pool, said inlet and outlet being connected outside of the cylinder.

4. A device as claimed in claim 3, in which the connection between the inlet and outlet is connected to a source of compressed air.

JOHN W. PAGE.