Nov. 17, 1953 C. L. WETSEL 2,659,592

LOAD WEIGHT INDICATOR FOR FORK-LIFT TRUCKS

Filed April 7, 1952

Fig. 1

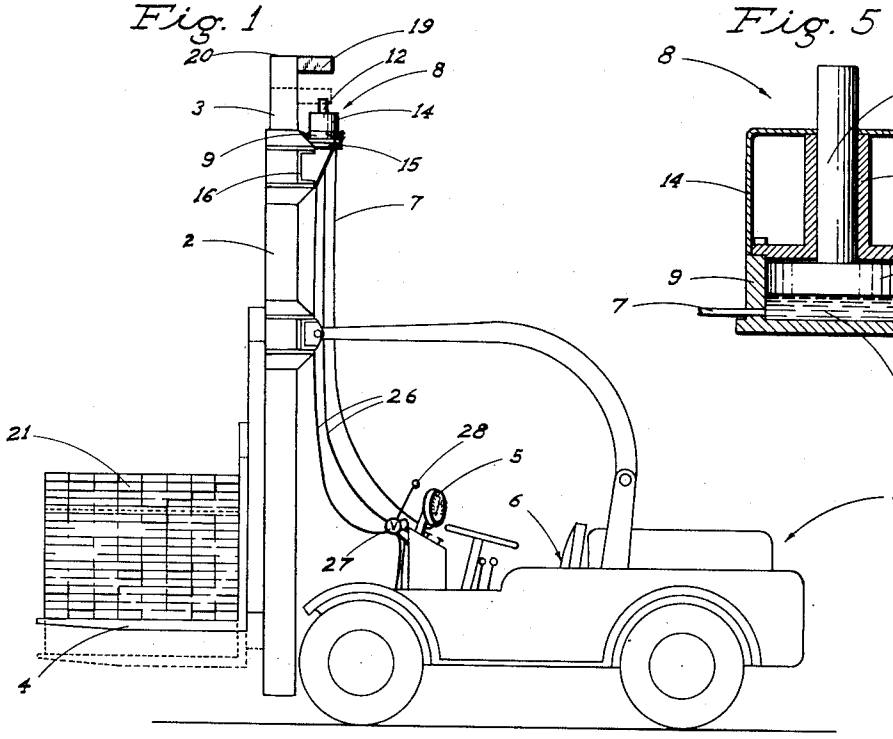


Fig. 5

Fig. 2

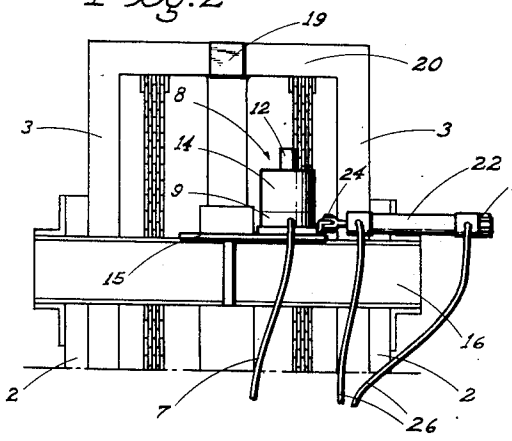


Fig. 3

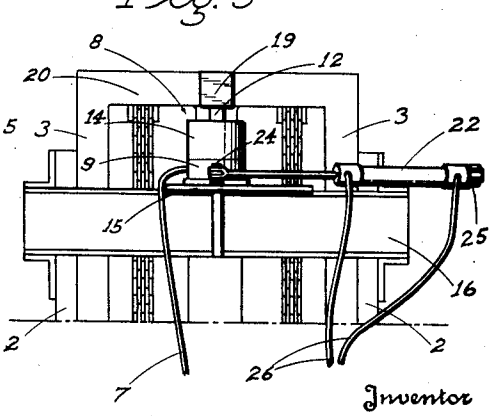
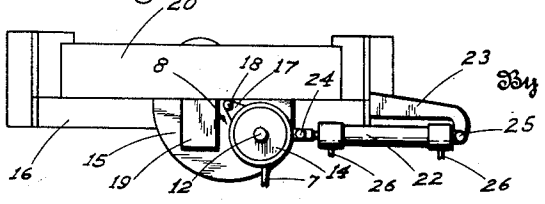


Fig. 4



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LOAD WEIGHT INDICATOR FOR FORK-LIFT TRUCKS

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4 Claims. (Cl. 265—40)

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In the use of a fork lift truck it is often desirable that the operator know the weight of each load picked up on the forks, and the present invention provides, as a major object, a novel indicator for such purposes.

Another important object of the present invention is to provide a load weight indicator as above which is hydraulically operated; the device including a hydraulic gauge within view of the operator and calibrated in terms of weight, and a hydraulic pressure unit communicating with the gauge adapted to be subjected to the weight of the load in a novel manner.

An additional object of this invention is to provide a load weight indicator as in the preceding paragraphs wherein the device is selectively operable, i. e. at the will of the operator of the fork lift truck. This is accomplished by mounting the hydraulic pressure unit for movement, by power means, between a working position in the path of a member on the elevator frame of the fork lift truck, and a non-working position clear of said elevator frame.

A still further object of this invention is to provide a load weight indicator which is capable of being readily and conveniently applied, as an attachment, to a conventional fork lift truck; the device, when so attached, not in any way obstructing the operation of the truck.

It is also an object of the invention to provide a load weight indicator which is designed for ease and economy of manufacture.

Still another object of the invention is to provide a practical, reliable and accurate load weight indicator for fork lift trucks, and one which will be exceedingly effective for the purpose for which it is designed.

These objects are accomplished by means of such structure and relative arrangement of parts as will fully appear by a persual of the following specification and claims.

In the drawings:

Fig. 1 is a side elevation of a fork lift truck embodying the present invention.

Fig. 2 is an enlarged rear elevation of the upper portion of the frame assembly of the truck showing particularly the mounting of the hydraulic pressure unit; the latter being shown in its non-working position.

Fig. 3 is a similar view but shows the hydraulic pressure unit as shifted to its working position.

Fig. 4 is a top plan view of the structural arrangement as in Fig. 3.

Fig. 5 is an enlarged sectional elevation of the hydraulic pressure unit detached.

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Referring now more particularly to the characters of reference on the drawings, the invention is here shown as mounted in connection with a conventional fork lift truck indicated generally at 1, which truck includes, at the front, an upstanding main frame 2 having a movable or elevator frame 3 thereon. The elevator frame 3 is run up or down by conventional power means, and said elevator frame carries the forwardly projecting load supporting forks 4.

The present invention comprises a hydraulic gauge 5 calibrated in terms of weight and mounted on the fork lift truck 1 directly ahead of the operator's seat 6, whereby such gauge is disposed for easy reading.

The hydraulic gauge 5 is connected by a hydraulic pressure conduit 7, flexible at least in part, with a hydraulic pressure unit indicated generally at 8.

The hydraulic pressure unit 8 comprises a relatively short upstanding cylinder 9 closed top and bottom. A piston 10 works in the cylinder 9 on a quantity of hydraulic fluid 11 in said cylinder. A piston rod 12 upstands from the piston 10 and is slidable through a guide sleeve 13 which projects upward from the top of the cylinder; such guide sleeve 13 being enclosed within a protective housing 14. The piston rod 12 projects some distance above the guide sleeve 13 and protective housing 14 as shown.

The above described hydraulic pressure unit 8 is set on a horizontal platform 15 which is fixed to and projects rearwardly from the center portion of the top cross beam 16 of the main frame 2.

The hydraulic pressure unit 8 is formed at the bottom with a radial arm 17 which extends inwardly to a pivot 18 on the platform 15 substantially centrally of the latter. As so mounted, the hydraulic pressure unit 8 is swingable between a non-working position clear of the vertical path of a lug 19 which projects rearwardly from the center of the top cross beam 20 of the elevator frame 3, as shown in Fig. 2, and a working position directly below said lug 19 as shown in Fig. 3.

When the hydraulic pressure unit 8 is disposed in its working position directly below the lug 19, the latter comes to rest on the piston rod 12 shortly before the elevator frame 3 reaches its lowermost point of movement.

As a consequence, weight of the elevator frame 3 and the load 21 on the forks 4 are in their entirety imposed directly on the hydraulic pressure unit 8, i. e. on the piston 10 working against the fluid 11; it being understood that the power means which works the elevator frame is totally

relieved during the period of the weight recording. The cylinder 9 is in communication with the conduit 7 so that pressure from the cylinder 9, produced by the load weight as above, is transmitted to and reflects itself in the gauge 5, which gauge has a tare corresponding to the weight of the elevator frame 3 and forks 4 whence the gauge 5 reads directly and accurately in terms of the weight of load 21.

After the weight of the load 21 has been determined and recorded by the operator, the hydraulic pressure unit 8 is swung out of the path of the lug 19 so that the elevator frame 3 may continue its downward movement until the forks 4 are at ground level; such movement of the unit 8 being accomplished by power means as follows:

A small double acting power cylinder 22 extends laterally from the unit 8, being connected between the latter and an outrigger arm 23 on the main frame 2, the points of pivotal connection being indicated at 24 and 25. It will be recognized that upon actuation of the power cylinder 22 to extend it, the unit 8 is moved to working position while contraction of said power cylinder moves the unit 8 to non-working position.

The double acting power cylinder 22 is controlled by the operator through the medium of a valve regulated fluid pressure supply conduit system 26 which includes a control valve 27 therein; such valve being worked by an upstanding hand lever 28.

With the described weight indicator, the weight of each load 21 picked up by the fork lift truck 1 is accurately indicated to the truck operator who notes the weight upon a suitable record. In this way the total weight of a load placed part by part on a hauling truck by the fork lift truck can be accurately ascertained in order to prevent overloading. This is only one example of many advantages which accrue from use of the described load weight indicator.

From the foregoing description it will be readily seen that there has been produced such a device as substantially fulfills the objects of the invention, as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention, as defined by the appended claims.

Having thus described the invention, the following is claimed as new and useful, and upon which Letters Patent are desired:

1. A load weight indicator for a fork lift truck having a load-supporting elevator frame and an upstanding main frame on which the elevator frame is vertically movable, the latter frame including forwardly projecting lift forks; the indicator comprising a fluid pressure unit mounted on the main frame on the back side thereof and including an upwardly projecting vertically movable element whose downward movement exerts pressure on the fluid in the unit, a pressure gauge calibrated in terms of weight mounted on the truck, and a conduit between the gauge and unit; and a lug fixed on the elevator frame and projecting therefrom in overhanging relation to the working position of said movable element and at a level to engage the same upon lowering of the elevator frame to adjacent its lowest position on the main frame.

2. A device as in claim 1, with means mounting the unit on the main frame for movement between a working position in vertical alinement with the lug to a position clear of the same.

3. A device as in claim 1, in which the unit includes a vertical axis cylinder; a platform fixed on the main frame on which the cylinder rests, a radial arm projecting from the cylinder, and means pivoting the arm on the platform in position to enable the cylinder to be shifted horizontally between a working position in vertical alinement with the lug to a non-working position clear of said lug.

4. A device as in claim 3, with means to shift the cylinder comprising a bracket on the main frame laterally offset from the cylinder, and a hydraulic cylinder unit pivoted at one end on the bracket and at the other end on the cylinder in circumferentially offset relation to the arm.

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