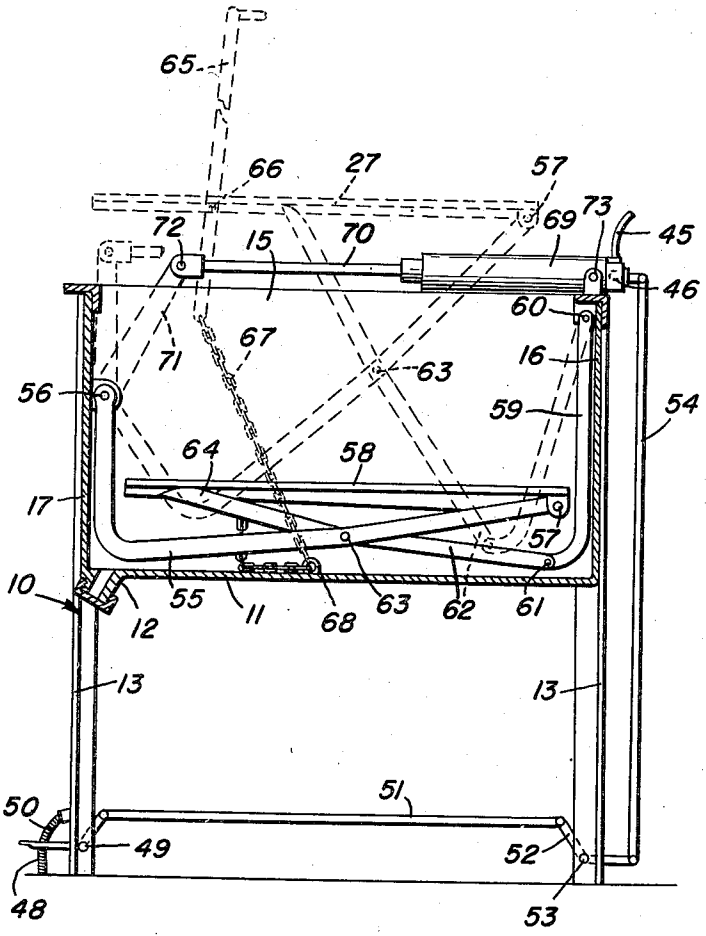
Jan. 10, 1950 R. E. BENSON 2,494,224

TESTING VAT ELEVATOR

Filed July 23, 1947



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Patented Jan. 10, 1950

2,494,224

UNITED STATES PATENT OFFICE

2,494,224

TESTING VAT ELEVATOR

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Application July 23, 1947, Serial No. 762,968

5 Claims. (Cl. 187—18)

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This invention relates to new and useful improvements in elevators and more especially short-lift elevators such as used in connection with testing vats to repair engine-cooling or automotive radiators or radiator repair benches, whereby an apparatus is provided for testing and repairing leaks in radiators and so that it can be raised or lowered to be filled with air or otherwise, or submerged in water or other solution in a tank, to test leaks, or in an upright position, when raised, so that any solder that is used to repair the radiator will fall into the water from where it can be reclaimed and reused. However, it is to be understood that the primary purpose of the invention is to provide a novel and simple mechanism whereby the platform of the elevator may be raised or lowered in a simple and efficient manner, either by power or manually, and therefore it is not desired to be limited to any particular use even though the device may be raised by hydraulic means, by compressed air, and a novel arrangement of lazy tong levers whereby the platform or supporting surface will always remain in horizontal position, and can be quickly raised and lowered with a minimum of expenditure of power to efficiently serve its purposes.

Therefore, an important object of the invention is to provide an elevator and novel means for raising and lowering the same embodying the simple basic principles of the cross bar lift designed for the purpose of lowering or raising any article to be tested, in a water or liquid filled vat or tank or otherwise, securing a maximum of vertical movement in either direction, up or down, so as to raise or lower the supporting surface of the elevator with a comparatively short movement of the operating means, thus rendering the device simple in principle and applicable, from a mechanical viewpoint, to various operating mechanisms other than for the purpose of testing elevators or in connection with a vat as set forth, the motive power being attached or applied to operate the elevator manually or by hydraulic or air power and operated with wires, cables, rods, chains and levers, or an oscillating shaft capable of being operated in any suitable manner and providing a device which will require a minimum of attention and eliminating complicated mechanism with the use of slides and pistons requiring more attention and upkeep when used under water, and especially so when the water is diluted with acids. The device may be known as a compound lift, which is the invention per se adapted for use with any kind of an elevator, the principle being to have the elevator move against a stationary linkage, causing operating forces for the compound lift whereby the same may be readily raised or lowered to the desired point. Another and important object of the invention is to provide an elevator of the lightest type of construction for lifting devices, without limiting the same to the particular use or uses mentioned but capable of application for various lifting purposes as embodied therein, within the scope of the invention, in addition to being inexpensive to produce and therefore economical in cost, and being simple to operate and efficient in use.

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A still further object of the invention is to provide a lift proper embodying novel principles of supporting and raising and lowering the same, for use where the horizontal surface of the elevator floor or platform is of equal or greater dimensions than the vertical movement of the lift to raised or lowered positions, so that the device will be practical for the removing or replacing of giant tires as large as 4 ft. by 12 ft. in diameter and with mobile wheels under the lift, so that it will constitute a wheeled carriage or lift device and may be used for stacking or transferring plate or other various uses.

Other objects and advantages reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming part hereof, wherein like numerals refer to like parts throughout, and in which the figure is a vertical sectional view through the testing vat elevator of the present invention, some parts being shown in elevation.

Referring to the drawings in detail, in which like reference characters designate corresponding parts throughout the several views, the elevator is shown applied to a tank 10, such as used in the repair and testing of radiators for automobiles and the like, although it is to be specifically understood that the invention is not limited to such use. The tank 10 is supported in any suitable manner to raise the inclined or horizontal bottom 11 thereof above the ground or supporting surface or floor and is provided with a suitable drain 12. As illustrated, the tank is supported upon side walls or legs 13, the work side or end being indicated at 16, while the back or rear side of the vat or tank is indicated at 17, suitable provision being made to supply the tank with water or an acid solution when used for repairing and testing radiators, or otherwise. Any suitable size of tank, vat or tub may be employed, or the lift may be provided separate and apart from such tank for

various elevating or lifting purposes, as it is thought will be obvious.

An arm or lever in the form of an angular cantilever **55** is provided which is pivoted at **56** to a bracket at the inside and front of the tank or vat and extending downwardly along the adjacent side, and then upwardly in an inclined position, where at its free end it is pivotally connected as shown at **57** to a platform or floor plate **58** including spaced parallel angle bars **27**. Another supporting arm **59** is suspended pivotally at the top of the tank at the back, as indicated at **60**, and has its lower end curved inwardly for pivotal connection at **61** to the adjacent end of the rocker arm **62** which, in turn, is crossed relative to the arm or lever **55** and pivotally connected thereto, as indicated at **63**, with its free end extending upwardly in slightly obtuse angled relation to the lower portion, and tapered or beveled in rounded formation, as indicated at **64**. The radiator elevating member **65** is shown pivoted as indicated at **66** to the angle bars **27** and has one end, namely, its short end, connected by a flexible member or chain **67** to the floor and suitable means **68** provided for the purpose, so that when the elevator platform or plate is raised, the member **65** will be thrown on its pivot to an upright position to raise the radiator to such position for inspection or further repair, either at the horizontal top of the tank or above the same, or to permit the same to be lowered into the tank for submerging the radiator for testing the same as with an inner tube of an automobile pneumatic tire. The action of the member **65** is automatic during the raising and lowering of the elevator, so that when the latter is lowered into the tank, the member **65** will move down therewith at the pivot **66** so as to allow it to assume a horizontal position in line with the elevator platform or floor **27** and therefore lower the radiator flat upon the platform instead of moving to an upright position to which position it is advanced or moved when the elevator is raised.

In order to actuate the elevator a hydraulic or fluid power-operated device which may include air, is provided, including a cylinder **69** which is positioned horizontally on the top of the tank and its piston and rod **70** connected to an arm **71**, as indicated at **72**, at the pivot axis **56** of the cantilever or arm **55**, to swing the latter and its cross arm **62** upwardly or downwardly in the manner clearly shown in solid and dotted lines in the drawings, in the raising and lowering of the elevator. The cylinder **69** may be mounted upon a bracket pivotally, as indicated at **73**, and may be equipped with a fluid connection conduit or pipe **45** controlled by a valve **46** to admit fluid under pressure to the cylinder. The valve **46** may be operated from a foot treadle **48** in the form of an angle lever pivoted at **49** to a bracket at the inside of the front of the tank near the floor and cooperating with a notched segment **50** at the outside to hold the treadle in adjusted position. A link **51** connects the free end of the treadle with an angular lever **52** pivoted at **53** adjacent the back of the tank and floor, the lever **52** being attached to a rod which is connected to the valve **46**. In this connection, it should be noted that the compound arm or lever arrangement provides for a greater vertical movement of the elevator than the horizontal dimension of the elevator, so that the latter can be raised at its platform above the top of the tank or vat, or lowered substantially in close proximity to the bottom thereof. Thus, it will be seen that the elevator may be raised to the extreme height above the top of the tank or vat, with free access to all sides, for removing or replacing work on the elevator, such as a radiator, without any superstructure or parts extending above the top of the elevator, this being a great advantage over other types of devices heretofore provided and used. This structure is arranged so as to support and raise many times its own weight, and when used in a liquid tank for testing purposes, the elevator is allowed to lower itself of its own weight down into the liquids so that the air test may be made, the same as with a tire tube, and after leaks are located, the elevator is brought back to the top of the tank by applying pressure on the foot pedal which operates the valve **46**. The elevator, as described, may be used for various purposes, but of the type shown and described, it may be installed in a liquid tank without any rods or pistons working or passing through the walls of the tank below the liquid level, thereby eliminating leaks caused by such constructions.

In view of the foregoing description taken in conjunction with the accompanying drawings, it is believed that a clear understanding of the device will be quite apparent to those skilled in this art. A more detailed description is accordingly deemed unnecessary.

It is to be understood, however, that even though there is herein shown and described a preferred embodiment of the invention, the same is susceptible to certain changes fully comprehended by the spirit of the invention as herein described and within the scope of the appended claims.

Having described the invention, what is claimed as new is:

1. An elevator of the class described for a tank or otherwise, a pair of crossed levers, one of said levers constituting a cantilever having an upwardly extending end pivotally mounted, the other lever being pivotally connected to the first lever in crossed relation relative thereto, means pivotally supporting the lower end of the second lever, the upper end of the second lever being tapered and beveled, a platform pivotally connected at the free end of the first lever and extending over the upper end of the second lever for slidable movement of said latter end with respect to the platform, whereby when the levers are raised and lowered, the platform will remain in a horizontal position.

2. An elevator of the class described for a tank or otherwise, a pair of crossed levers, one of said levers constituting a cantilever having an upwardly extending end pivotally mounted, the other lever being pivotally connected to the first lever in crossed relation relative thereto, means pivotally supporting the lower end of the second lever, the upper end of the second lever being tapered and beveled, a platform pivotally connected at the free end of the first lever and extending over the upper end of the second lever for slidable movement of said latter end with respect to the platform, whereby when the levers are raised and lowered, the platform will remain in a horizontal position, an arm on the pivot connection of the first lever, and foot-operated power means connected to said latter arm for swinging said levers on their pivot axes and on their pivotal connection relative to each other to move the same to raised extended positions for raising the platform or for permitting the lowering thereof into collapsed position for the purposes described.

3. In an open top substantially rectangular tank; an elevator comprising first and second L-shaped cantilevers having short vertically extending legs and longer horizontally extending legs, means to pivot the free ends of the short legs to opposing side walls of the tank adjacent the top end thereof, the longer legs being crossed and pivoted intermediate their ends, said first lever having a bevel on the free end of its longer leg, a platform pivoted to the free end of the longer leg of said second lever and slidable on said bevel, and means connected to one of said levers for raising and lowering said platform.

4. The combination of claim 3 and a means carried by said platform for additionally elevating an object on said platform.

5. The combination of claim 4 wherein said means includes a bar pivoted intermediate its ends to said platform and a flexible member connecting one end of said bar to the bottom wall of the tank.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,012,203	Hunt	Dec. 19, 1911
2,284,531	Miller et al.	May 26, 1942