

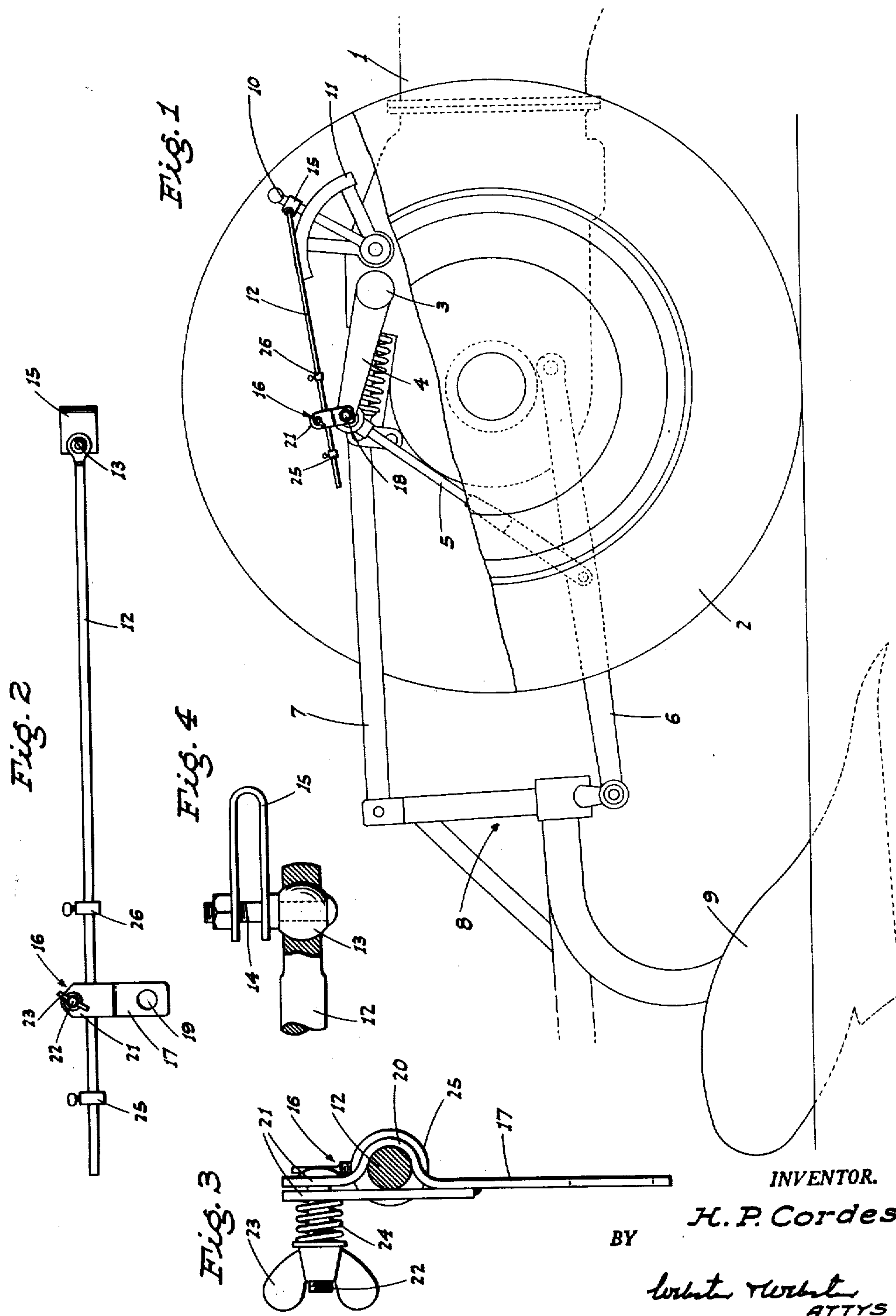
Feb. 6, 1951

H. P. CORDES

2,540,429

CONTROL DEVICE FOR POWER ACTUATED LIFTS ON TRACTORS

Filed June 6, 1947



INVENTOR.

H. P. Cordes

BY

Walter Herbert
ATTYS

UNITED STATES PATENT OFFICE

2,540,429

CONTROL DEVICE FOR POWER ACTUATED
LIFTS ON TRACTORS

Henry P. Cordes, Modesto, Calif.

Application June 6, 1947, Serial No. 752,961

3 Claims. (Cl. 74-469)

1

This invention is directed to, and it is an object to provide, a novel control device for tractors which include a selectively vertically adjustable, hydraulically power actuated lift for connection in draft relation to an earth working implement; lifts of this type being difficult to maintain at the point of initial vertical setting, and the present device functioning to automatically accomplish such desirable result.

Another object of the invention is to provide a control device, for the purpose described, which is responsive to undesired up-or-down movement of the earth working implement relative to said point of initial vertical setting thereof; response of the device to such movement being imparted to the lift control lever, which the tractor includes, in a manner to adjust said lever to an extent to cause the power lift to return the implement to said point of initial vertical setting.

An additional object of the invention is to provide a control device, as above, for a tractor having a power lift which includes a power actuated lift arm and a hand lever which causes the power means to regulate the position of such lift arm, both the lift arm and hand lever being swingable in a longitudinal vertical plane, and the control device being connected between the same.

A further object of the invention is to provide a control device, as in the preceding paragraph, which includes a push-pull unit, having an adjustable friction, slip connection therein, operative to impart motion of the lift arm to the hand lever, but permitting the hand lever to be manually operated or set independent of the lift arm.

A further object of the invention is to provide a simple, practical, convenient, and easy to install control device for power actuated lifts on tractors, and yet 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 perusal of the following specification and claims.

In the drawings:

Fig. 1 is a side elevation of the control device as mounted on a tractor.

Fig. 2 is an enlarged side elevation of such device, detached.

Fig. 3 is a fragmentary elevation of the adjustable friction clamp which cooperates with the control rod between the latter and the bracket attached to the power actuated lift arm.

Fig. 4 is a fragmentary plan view of the connection, detached, adapted to secure the forward

2

end of the control rod to the hand lever on the tractor.

Referring now more particularly to the characters of reference on the drawings, the control device is especially designed for use in connection with a tractor 1 which includes, between the transversely spaced rear wheels 2, a hydraulically actuated cross shaft 3 having a radial and rearwardly projecting lift arm 4 fixed thereon.

The lift arm 4, which is raised or lowered by actuation of the cross shaft 3, is pivotally connected at its outer end to the upper end of a link 5 which extends rearwardly and downwardly to one of the draft links 6 of the power lift. Such power lift also includes a top stabilizer link 7 and an upstanding tool mounting frame 8 pivotally connected between the links 6 and 7, the latter being vertically swingable with the frame 8 to adjust the vertical position of an earth working implement 9 carried by said frame 8.

Ahead of the lift arm 4, and in generally longitudinal alinement therewith, the tractor includes a hand lever 10 working in cooperation with a guide quadrant 11. The hand lever 10 is movable forwardly or rearwardly to cause actuation of certain hydraulic mechanism in the tractor to effect rotation of the shaft 3 so as to cause lowering or raising, respectively, of the arm 4, and consequently corresponding motion of the implement 9.

In normal operation of the tractor the operator adjusts the hand lever 10 until the described power actuated lift, to which the implement 9 is connected in draft relation, is disposed at a desired point of initial vertical setting. However, on certain tractors the hydraulic mechanism, though initially set by the hand lever 10, tends to cause or permit creeping of the power lift either upwardly or downwardly, thus failing to maintain the desired point of initial vertical setting of the implement 9.

To overcome this result, and to automatically maintain such initial setting of the implement, this invention provides the following control device:

A rigid control rod 12 extends lengthwise of the tractor between the upper end portion of the hand lever 10 and the rear end of the power-actuated, lift arm 4, being connected to these parts as follows:

At its forward end the control rod 12 is fitted with a universal connection 13, which includes a cross bolt 14 extending through a U-clamp 15. This U-clamp engages about the hand lever 10

3

and is fixed thereto by tightening of said cross bolt 14.

The control rod 12 and rear end of the lift arm 4 are coupled together by an adjustable friction, slip connection, indicated generally at 16. This connection comprises an upstanding bracket 17 rigidly secured, at its lower end, to the arm 4 by a cross bolt 18 which extends through a hole 19 in said bracket. Above the hole 19 the bracket 17 is formed with an adjustable friction clamp 20, through which the control rod 12 slidably engages; said clamp including spaced-apart ears 21 connected by a cross bolt 22 which extends beyond the ears some distance on one side and is there fitted with a threaded-on finger nut 23. A compression spring 24 surrounds the bolt 22 between the nut 23 and one of the ears 21, whereby adjustment of the finger nut 23 increases or decreases the friction or tension of a clamp 20 on the rod 12.

With the above described control device mounted on a tractor, as shown, the operator sets the hand lever 10 to effect adjustment of the implement 9 to the desired point of initial vertical setting; such motion of the hand lever 10, and consequent motion of the control rod 12, being accomplished independently of the lift arm 4, by reason of the fact that said rod then slides through the clamp 20 of the adjustable friction, slip connection 16.

Thereafter, if the implement 9 creeps up or down relative to its point of initial vertical setting with corresponding motion of the lift arm 4, such motion is imparted through the connection 16 to the control rod 12, which in turn moves the hand lever 10 in a direction to cause compensating actuation of the power lift to return the implement 9 to said point.

When the control device functions, automatically, to accomplish the above result, the control rod 12 does not slip through the adjustable clamp 20, for the reason that the resistance to sliding of said rod through the clamp is greater than the resistance of the hand lever to motion.

It will thus be seen that once the operator sets the hand lever 10 to obtain a predetermined working depth of the implement 9, the control device thereafter automatically, and with quick response, resets the lever 10, one way or the other, to the extent necessary to compensate for the misadjustment. In addition to the above described function, the control device has a further purpose, as follows:

A pair of adjustable stop collars 25 and 26 are mounted on the control rod 12 on opposite sides of the clamp 20; such collars serving as a means to automatically limit the bottom position and top position of the power lift and suspended earth working tool.

4

When the operator shifts the hand lever 10 forwardly a certain distance the stop 25 will abut the clamp 20, thus preventing further movement in such direction of the control rod and lever, and in turn limiting the bottom position to which the earth working implement 9 may be lowered. Similarly, when the operator shifts the hand lever in a direction sufficient to engage the stop 26 with the clamp, the top position of the power lift is thus effectively limited.

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. In a lift means which includes a power operated shaft and a radially extending lift arm fixed at its inner end to the shaft and operated thereby and means to control the application of power to the shaft, such latter means comprising in part an operating lever; means to effect movement of the lever upon movement of the arm, such last named means comprising a rigid control rod pivoted to the lever, and an adjustable friction slip connection between the rod and the arm adjacent its outer end.

2. A structure as in claim 1 in which the adjustable friction slip connection comprises an upstanding bracket fixed on the arm adjacent its outer end and an adjustable friction clamp fixed on the bracket and embracing and frictionally engaging the control rod.

3. A structure as in claim 2 in which the clamp includes a pair of outer spaced apart ears, a cross bolt projecting through said ears, a nut threaded on the outer end of the bolt, and a compression spring interposed between the nut and the adjacent ear.

HENRY P. CORDES.

REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
419,874	Parkin	Jan. 21, 1890
1,627,568	Martin	May 10, 1927
2,286,256	Brown	June 16, 1942
2,311,516	Brown	Feb. 16, 1943
2,427,871	Mott	Sept. 23, 1947