

March 31, 1959

T. ANDERSEN
OVERHEAD LOADER

2,879,908

Filed Jan. 9, 1951

2 Sheets-Sheet 1

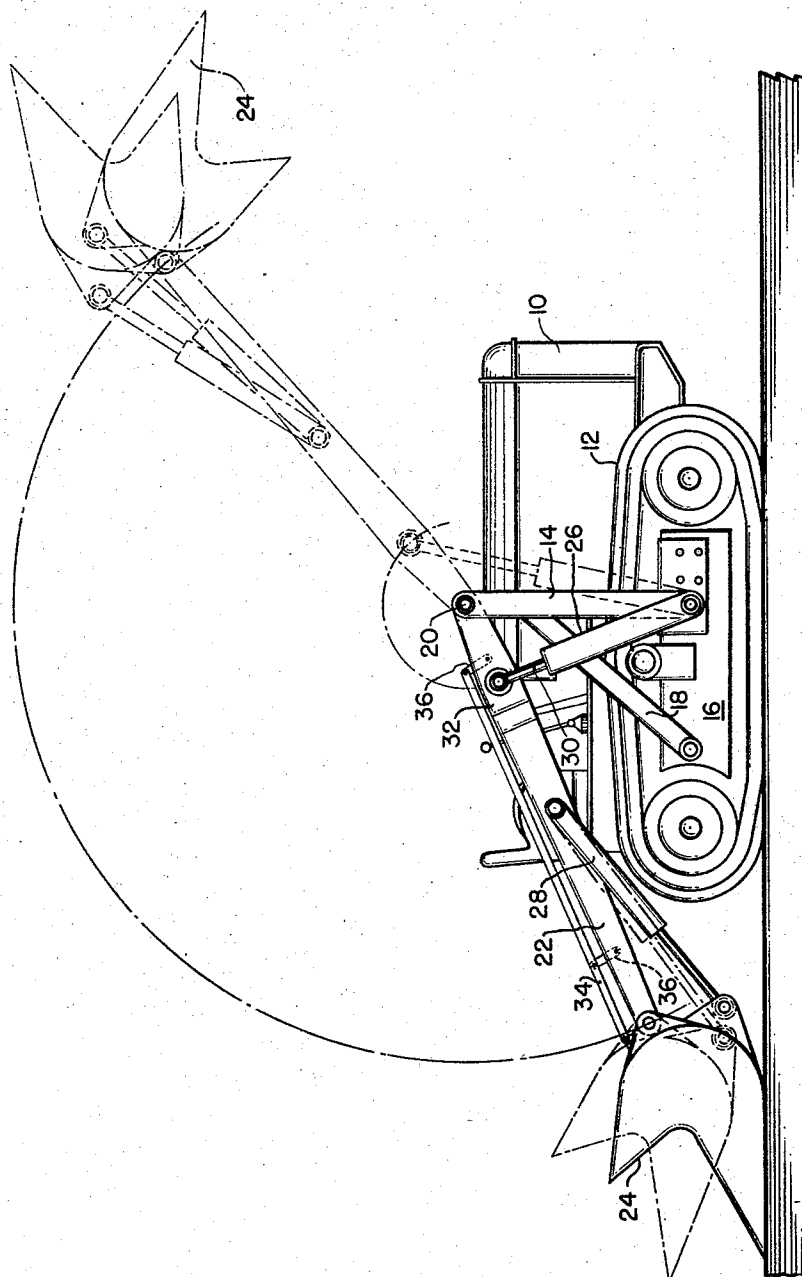


Fig. 1

Inventor.
Tengel Andersen
By Kenneth J. Juncy, Victor and
Hildner, Attys.

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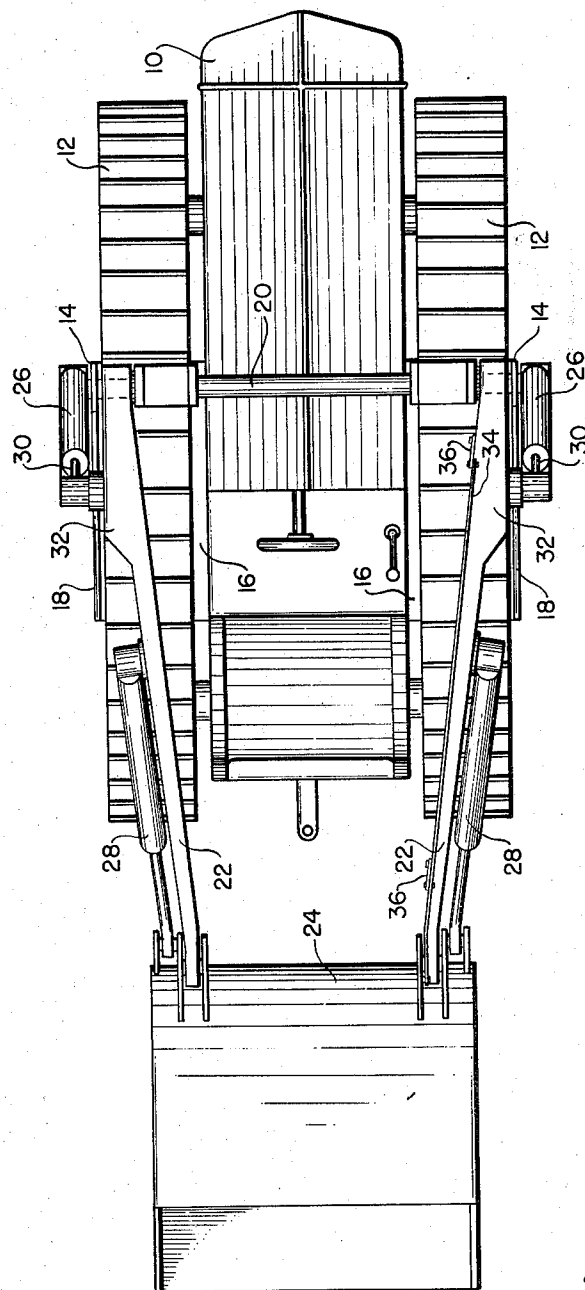


Fig. 2

inventor.
Tengel Andersen
by: Kenway, Jamney, Withers and
Hildner, Attys.

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2,879,908

OVERHEAD LOADER

Tengel Andersen, Cape May, N.J., assignor to Overhead Loader Corporation, Staten Island, N.Y., a corporation of New Jersey

Application January 9, 1951, Serial No. 205,186

4 Claims. (Cl. 214-131)

This invention relates to digging and loading attachments for vehicles and more particularly to an attachment for digging at one end of a vehicle and loading at the other.

In the past, overhead loaders, as they are called in the industry, have generally comprised a digging bucket mounted on push arms which are pivotally mounted on the vehicle frame. One type is described in my earlier jointly invented Patent No. 2,296,827, and another is disclosed in my co-pending application Serial No. 34,718, now Patent No. 2,537,010. In practice, these arrangements have had certain disadvantages, and this invention is in substance an improvement over them. The type described in Patent No. 2,296,827 required a low pivot point for the push arms and a hydraulic lifting jack mounted above. Such an arrangement, particularly when applied to caterpillar tractors, had numerous disadvantages. First, the push arms had to be widely spaced in order to pass outwardly of the caterpillar treads. This necessitated an inward convergence of the arms (as shown in Fig. 3 of that patent) which proved detrimental in practice because the constant bending caused by digging tended to fatigue the metal in the arms. Second, the arms had to be long enough to clear the head of the operator, thus necessitating a heavy arm construction and a poor leverage combination. Thirdly, the lifting jack had to be mounted for more than 180° pivotal movement and required a very long piston. Some of these disadvantages were overcome by the construction shown in my co-pending application Serial No. 34,718, now Patent No. 2,537,010 but as shown it comprises a double arm arrangement on each side of the vehicle and therefore is heavier and more expensive.

It is an object of my invention to provide an improved overhead loader suitable for attachment to a caterpillar type tractor, said loader having a single arm on each side. A further object of my invention is to provide such an overhead loader with straight arms leading directly to the digging bucket, carrying the digging bucket well clear of the operator's head and being shorter than the overhead loader arms previously employed. An additional object of my invention is to provide such an overhead loader with a lifting jack arrangement which requires only a limited amount of pivotal movement, preferably less than 60°. An additional object of my invention is to provide such a straight, single arm (on each side) overhead loader attachment in combination with apparatus for imparting a push-tilt to the digging bucket as a preliminary step to loading, and wherein said push-tilt mechanism operates also as a dumping mechanism.

In the accomplishment of these objects, I mount a single push arm at each side of a caterpillar tractor and locate the pivot point for such arms well above the level of the caterpillar treads. A digging bucket is pivotally mounted at the extremities of these arms and when in digging position, the arms slope downwardly from the pivot point clearing the caterpillar treads. It is a feature of my invention that the elevated pivot point of the push arms permits a short arm to be employed and still provide adequate clearance over a roof over the head of the operator when the arms are actuated to pass over the tractor for dumping. It will be seen that this feature of providing short push arms provides a short lifting arm, thereby permitting lighter construction and less strain on the hydraulic lifting jack.

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It is an additional feature of my invention that the lifting jack is pivoted substantially directly beneath the pivot point of the push arms and that it is adapted to control the position of the push arms without passing through a wide pivot arc. A further feature of my invention relating to the lifting jack is that the length of its piston is relatively short.

An additional feature of my invention in combination with the previously mentioned features is a hydraulic jack arrangement mounted on each push arm and communicating with the bucket to actuate the bucket into a push-tilt position while digging and into a dumping position while loading.

Further objects and features of my invention will best be understood and appreciated from a detailed description of a preferred embodiment thereof, selected for purposes of illustration, and shown in the accompanying drawings, in which:

Fig. 1 is a view in side elevation of the single arm overhead loader of my invention; and

Fig. 2 is a plan view of the same.

The preferred embodiment of my invention herein shown comprises a tractor 10, having caterpillar treads 12. Side braces 14 are mounted on laterally extending supports 16 on each side of the tractor. These supports 16 are secured centrally to the frame of the tractor. The braces 14 are buttressed rigidly by a reinforcing brace 18 which likewise is secured to supports 16. At the upper end of the braces 14 a transverse shaft 20 is mounted extending across the top of the tractor, and serves as a pivot shaft for push arms 22 which are mounted at each end thereof inward from the braces 14. A digging bucket 24 is pivotally mounted on the push arms 22 at the ends thereof, and is shown in Fig. 1 in digging position in the rear of the tractor 10.

The mechanism provided for controlling the position of the push arms 22 and the position of the digging bucket 24 comprises conventional hydraulic jacks 26 for lifting the arms and jacks 28 for both dumping the bucket and for imparting a push-tilt to the bucket during digging. Lifting jacks 26 are mounted at each side of the tractor just outwardly from the braces 14 and are pivoted at their lower ends in the vicinity of the base of the braces 14 and substantially directly beneath the pivot shaft 20. Jacks 26 are pivotally connected at the upper ends of their pistons 30 to the push arms 22, and it will be seen that in this way the jacks 26 may be employed to elevate the push arms to a substantially vertical position. Momentum carries the push arms across this vertical position, and thereafter jacks 26 control the position of the push arms by merely reversing the procedure employed in controlling them prior to elevation to the vertical position from the opposite side. Lowering is controlled by releasing fluid in the jacks 26. It will be seen that with this arrangement, single acting jacks may be employed for controlling the position of arms 22. This is a distinct advantage and simplifies the hydraulic arrangement.

Jacks 28 are mounted directly onto each push arm 22 with their cylinders pivotally connected to the said arms and with their pistons pivotally connected to the lower portion of the bucket 24 when the latter is in the digging position. Hose connections for the jacks 26 and 28 are not shown in the drawing since they are manifestly conventional, and their construction is well known to those skilled in the art.

It will be seen that arms 22 are straight and extend downwardly from the pivot shaft 20 to the bucket 24 passing well above the caterpillar tread 12 when the bucket is in the digging position. It will also be seen that by this arrangement arms 22 may be substantially shorter than

the arms previously employed in having a single arm on each side, while still providing adequate clearance over the head of the operator of the tractor and even over a protective roof which may be provided for such operator. While the arms 22 actually are straight in the construction shown, they slope slightly inwardly and are provided with raised portions 32 in the vicinity of the connecting point for pistons 30. This arrangement permits the lifting jacks 26 to control the movement of the push arms 22 through a wide arc without interfering with braces 14.

The operation of my device is as follows. Digging is accomplished by lowering bucket 24 to the ground at the rear of the tractor with the pistons of jacks 28 fully retracted. The tractor is then backed, forcing the bucket into the gravel or other substance being loaded, and when firmly lodged therein, the piston of jacks 28 is extended thereby pushing and rocking the bucket rearwardly and upwardly. This extension of the pistons of jacks 28 to so rock and position the bucket is called "push-tilting" and is extremely beneficial in breaking out crusted material, as well as in securing a full bucket load of loose material. When the push tilting has been accomplished, the pistons 30 of lifting jacks 26 are extended, thereby raising the arms 22 and carrying the bucket overhead. During the early part of the lifting phase, it is generally necessary to retract the pistons of jacks 28 and cause the bucket to come back to a piston more closely in line with the arms 22. If this is not done, material may commence to fall out of the forward edge of the bucket before such is desirable. It will be seen, therefore, that jacks 28 are double-acting jacks. This reposition of the pistons of jacks 28 may be accomplished automatically by cams associated with the arms 22 acting upon hydraulic valves (not shown). When the arms 22 have passed by momentum through the vertical position, and have commenced to descend at the forward end of the tractor, complete dumping of the bucket 24 may be accomplished by extending the pistons of jacks 28 as is shown in dotted lines in Fig. 1.

With this short arm arrangement the connecting point between pistons 30 of jacks 26 and the arms 22 may be moved relatively close to the pivot shaft 20. This feature permits me to have a shorter stroke for pistons 30 and likewise reduces the pivot arc of the jacks 26 to substantially below 60° as may be seen in dotted lines in Fig. 1.

With regard to positioning the bucket 24 by operation of the jacks 28, it is contemplated in my invention that the fully retracted position of the piston of jack 28 may position the bucket to tilt substantially downward from the actual digging position. When this is done, it will be preferable with this arrangement to provide a linkage system on the arm 22 for indicating to the operator the position of the bucket. This linkage system may comprise a long link 34 pivoted to the bucket and supported by parallel links 36 which connect the long link 34 to the arm 22. Thus by providing a painted marker on the arm 22 to indicate the position of the links 36 when the bucket is in digging position, the operator may operate jacks 28 to bring the bucket 24 into digging position prior to actually lowering the bucket to the ground and position it by observation. While in some instances, it may be an advantage to have the fully retracted position of the piston of jacks 28 automatically set the bucket for digging position, certain uses may require a more variable position for the digging bucket 24 and in that case the indicating linkage system will be highly desirable. It will be seen that if the jacks 28 are capable of bringing the bucket 24 more into direct alignment with the arms 22 that the danger of unwanted spillage while the bucket passes overhead will be lessened.

Since certain minor variations of my invention will be apparent to those skilled in the art, it is not intended to confine the invention to the precise form herein shown, but rather to limit it in terms of the appended claims.

Having thus disclosed and described a preferred embodiment of my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. An overhead loader attachment for vehicles comprising, a single straight arm on each side of said vehicle, means connected to said vehicle pivotally supporting each said arm to pivot about a fixed and elevated axis relative to said vehicle and to pass through the vertical from one end of the vehicle to the other, a digging bucket pivotally mounted on the extremity of said arms, a single acting hydraulic lifting jack pivotally connected to each said arm at an intermediate point between the pivot axis of the arms and the pivot axis of the bucket, and pivotally connected to said vehicle at a point substantially directly below the pivot axis of said arms, and said jacks being positioned laterally outward of said arms and said arm supporting means whereby to pass clear of said arms and said arm supporting means when said arms pass through the vertical.

2. An overhead loader attachment for vehicles comprising, a single straight arm on each side of said vehicle, means connected to said vehicle pivotally supporting each said arm to pivot about a fixed and elevated axis relative to said vehicle and to pass through the vertical from one end of the vehicle to the other, a digging bucket mounted on the extremity of said arms, a single acting hydraulic lifting jack pivotally connected to each said arm at an intermediate point between the pivot axis of the arms and the bucket, and pivotally connected to said vehicle at a point substantially directly below the pivot axis of said arms, and said jacks being positioned laterally outward of said arms and said arm supporting means whereby to pass clear of said arms and said arm supporting means when said arms pass through the vertical.

3. An overhead loader attachment for vehicles comprising, a single straight arm on each side of said vehicle, means connected to said vehicle pivotally supporting each said arm to pivot about a fixed and elevated axis relative to said vehicle and to pass through the vertical from one end of the vehicle to the other, a digging bucket mounted on the extremity of said arms, a single acting hydraulic lifting jack pivotally connected to each said arm at an intermediate point between the pivot axis of the arms and the bucket, and pivotally connected to said vehicle at a point substantially directly below the pivot axis of said arms, and said jacks being positioned laterally of said arms and said arm supporting means whereby to pass clear of said arms and said arm supporting means when said arms pass through the vertical.

4. An overhead loader attachment for vehicles comprising, a single straight arm on each side of said vehicle, means connected to said vehicle pivotally supporting each said arm to pivot about a fixed and elevated axis relative to said vehicle and to pass through the vertical from one end of the vehicle to the other, a digging bucket mounted on the extremity of said arms, a hydraulic lifting jack pivotally connected to each said arm at an intermediate point between the pivot axis of the arms and the bucket, and pivotally connected to said vehicle at a point substantially directly below the pivot axis of said arms, and said jacks being positioned laterally of said arms and said arm supporting means whereby to pass clear of said arms and said arm supporting means when said arms pass through the vertical.

References Cited in the file of this patent

UNITED STATES PATENTS

Re. 23,166	Owen	Nov. 8, 1949
2,296,827	Andersen et al.	Sept. 29, 1942
2,316,760	Andersen et al.	Apr. 20, 1943
2,427,968	Hoover	Sept. 23, 1947
2,517,582	Lull	Aug. 8, 1950
2,537,010	Andersen	Jan. 9, 1951
2,560,674	Westall	July 17, 1951