Dec. 14, 1965 H. L. ORWIG 3,223,262

SIDE DUMP TRACTOR LOADER

Filed July 10, 1963 2 Sheets-Sheet 1

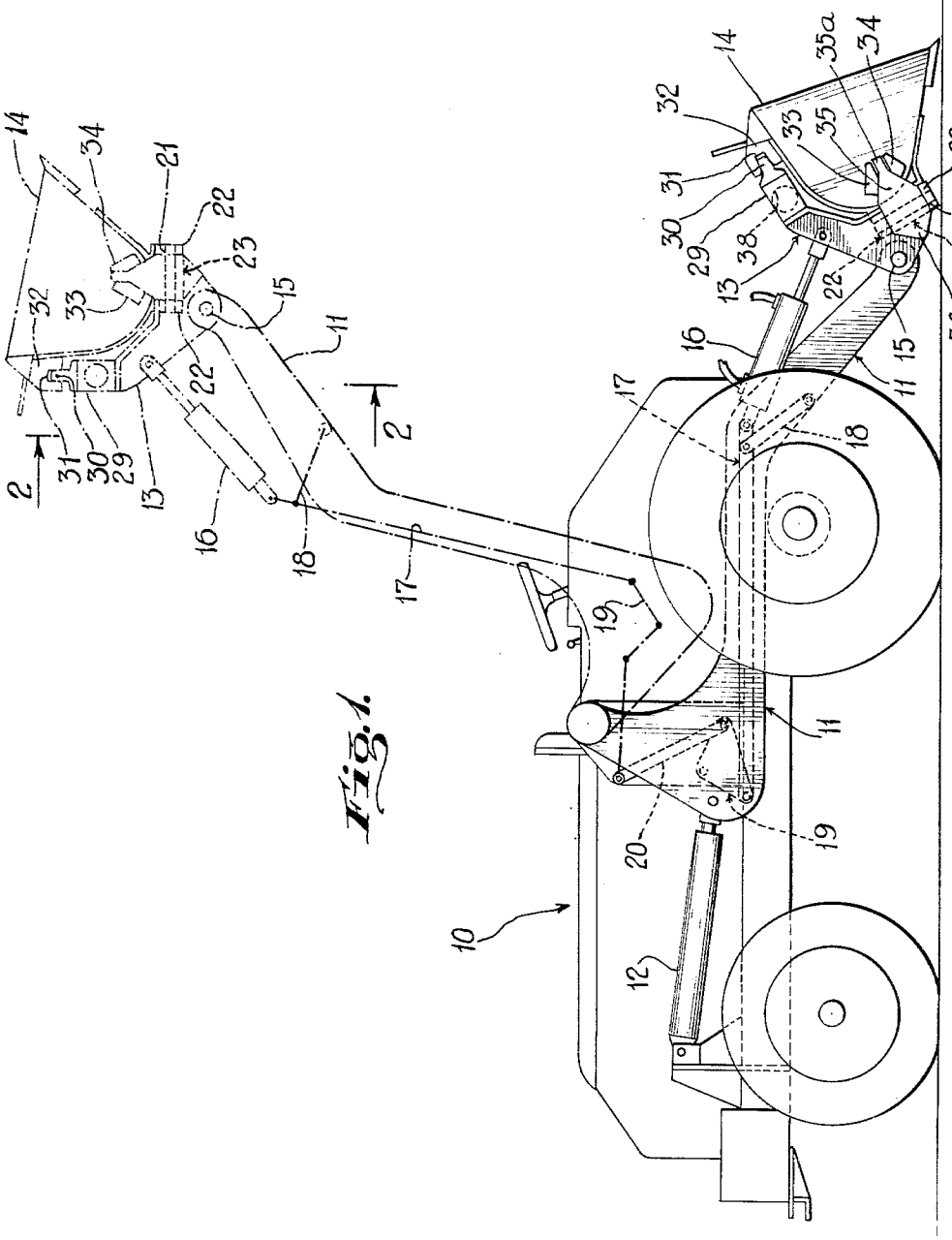


Fig. 1.

INVENTOR.
HERBERT L. ORWIG
BY
ATTORNEY

Dec. 14, 1965 H. L. ORWIG 3,223,262

SIDE DUMP TRACTOR LOADER

Filed July 10, 1963 2 Sheets-Sheet 2

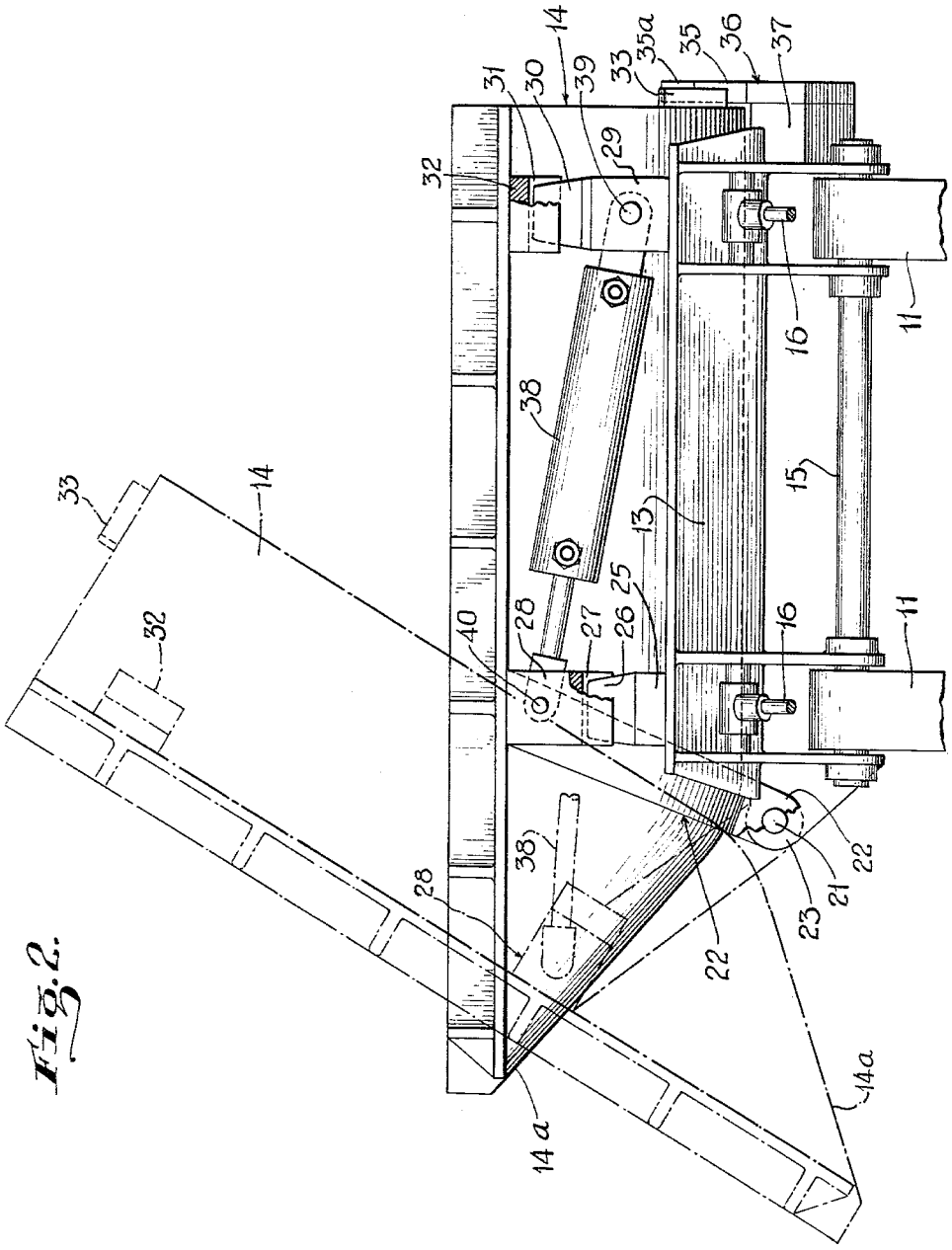


Fig. 2.

INVENTOR.
HERBERT L. ORWIG

BY A. H. Gold

ATTORNEY

United States Patent Office 3,223,262 Patented Dec. 14, 1965

3,223,262

SIDE DUMP TRACTOR LOADER

Herbert L. Orwig, Rochester, N.Y., assignor, by mesne assignments, to Yale & Towne Inc., New York, N.Y., a company of Ohio

Filed July 10, 1963, Ser. No. 293,972
5 Claims. (Cl. 214—140)

This invention relates to a tractor loader and in particular to a tractor loader in which the bucket is mounted for side dumping as well as forward dumping.

In front end loaders of this type, it has been considered necessary to provide a complicated latch arrangement that positively locks the bucket against side dumping during normal forward digging and dumping operations. With a tractor loader of this type, when it is desired to side dump, the latch must first be released and power means, such as a hydraulic ram, then operated to tip the bucket sideways about a longitudinally extending pivot axis.

In accordance with my invention, I have found that such a latch arrangement is not necessary, and that efficient, effective operation, both in forward digging and dumping and in side dumping, may be obtained if simple guides are provided on the bucket and on the bucket carrier which interengage when the bucket is in the normal digging position and accept and resist all moments of force exerted on the bucket except those in a direction to tip the bucket sideways for side dumping.

With this arrangement, distortion of the bucket is prevented and the side dumping pivot and side dumping ram are protected against damaging stresses being imposed thereon during normal forward digging and dumping operations. At the same time, the bucket is free to be tipped sideways to provide side dumping without the necessity of releasing a latch. During transit of the load, the side dumping ram is effective to hold the bucket against bouncing.

Other objects and advantages of my invention will become apparent from the following description when read in conjunction with the accompanying drawings wherein:

FIG. 1 is a side elevational view of the tractor loader constructed in accordance with my invention, showing in solid lines the bucket in the lowered position and in broken lines in the elevated position; and

FIG. 2 is a view taken on the line 2—2 of FIG. 1, showing in solid lines the bucket in normal digging position and showing in broken lines the bucket in side dumping position.

Referring to the drawings, and in particular to FIG. 1, there is shown a tractor loader 10 incorporating a side dumping bucket constructed in accordance with my invention. The particular tractor loader illustrated, except for the mounting of the bucket, is of the general construction shown in United States Letters Patent No. 2,645,369, and includes generally S-shaped booms or arms 11 which are pivotally attached at one end to the tractor loader and are adapted to be raised from the position shown in solid lines in FIG. 1 to the position shown in broken lines in FIG. 1 by hydraulic lift rams 12 which are mounted on each side of the tractor loader.

In accordance with the invention, a trough-shaped bucket carrier or cradle 13 which supports a bucket 14 is pivotally attached through pivots 15 to the outer ends of the S-shaped arms 11, and the carrier or cradle 13 and the bucket 14 are adapted to be tilted as a unit in the fore-and-aft direction of the loader by operation of rams 16. The rams 16 are pivotally attached at one end to the carrier or cradle 13 above the pivots 15 and are pivotally attached at their other ends to links 17. The links 17 form a part of a linkage system including links 18, bell cranks 19 and links 20 which serves, as described in

United States Letters Patent No. 2,645,369, to maintain the bucket in a particular position as the arms 11 are raised and lowered. Operation of the rams 16 serves to tilt the carrier 13 and bucket 14 as a unit in the forward direction as necessary to perform the usual forward digging and dumping operations.

Referring to both FIGS. 1 and 2, it can be seen that the bucket 14 is pivotally attached to the carrier or cradle 13 adjacent one side thereof by means of a hinge structure including, a pivot pin 21 which extends through clevis members 22 which are attached to the bucket 14 and extends through a bearing member 23 which is secured to the end of the carrier or cradle 13. The pivot pin 21 extends in a generally fore-and-aft or longitudinal direction, and the bucket 14 therefore can be tilted sideways relatively to the carrier or cradle 13 about the axis of the pivot pin 21 to the side dumping position as shown in broken lines in FIG. 2.

As best shown in FIG. 2, a guide member 25, having an upwardly extending tongue portion 26, is secured to the rear edge of the carrier or cradle 13, adjacent the pivot pin 21, and when the bucket 14 is in a normal position, as shown in solid lines in FIG. 2, the tongue portion 26 extends into a groove 27 formed in a downwardly extending guide member 28 which is attached to the upper rear edge of the bucket 14. It will be noted that the tongue portion 26 and the groove 27 extend in a direction which is substantially perpendicular to the axis of the pivot pin 21 about which the bucket tilts for side dumping. The tongue portion 26 and groove 27 therefore accept and resist all moments of force acting on the bucket 14 during normal digging and forward dumping operations, except those in a pure side dumping or tilting direction.

The opposite end of the rear edge of the carrier or cradle 13 is provided with a similar guide member 29 having an upwardly extending tongue portion 30 which is adapted to engage in a groove 31 formed in a second downwardly extending guide member 32 which is attached to the upper rear edge of the opposite end of the bucket 14. The tongue 30 and the groove 31 also extend in a direction substantially perpendicular to the axis of the side dumping pivot pin 21, whereby to accept and resist all moments of force exerted on the bucket during normal digging and dumping operations except those in a pure side dumping or tilting direction.

Referring now to FIG. 1, a pair of spaced guide plates or blocks 33 and 34 are secured to the end of the bucket 14, opposite the side dumping pivot 21. The blocks 33 and 34 diverge at their lower ends to form a tapered slot therebetween, and when the bucket 14 is in the normal digging position, a correspondingly tapered tongue portion 35 of a guide member 36, is received between the guide members 33 and 34. The guide member 36 is secured to the end of the carrier or cradle 13 by a suitable bracket member 37. When the tongue portion 35 of the guide member 36 is positioned between the plates 33 and 34, as shown in FIG. 1, they accept and resist moments of force acting on the bucket during normal digging operation, except those in a pure side dumping or tilting direction.

The tongue portion 35 is preferably provided with a pilot portion 35*a* which coacts with the inner tapered surfaces of the diverging portions of the guide blocks 33 and 34 to properly center the bucket 14 on the carrier or cradle 13 as the bucket is returned from side dumping position to normal position.

The bucket 14 is adapted to be tilted about the side dumping pivot 21 by a hydraulic ram 38. One end of the hydraulic ram 38 is pivotally attached by means of a pivot pin 39 to the guide member 29 which is secured to

the carrier or cradle 13, and the opposite end of the ram 38 is pivotally attached by means of a pivot pin 40 to the guide member 28 which is attached to the bucket 14. Extension of the ram 38, therefore, serves to tilt the bucket 14 upwardly about the pivot pin 21 to the side dumping position shown in broken lines in FIG. 2, while retraction of the ram 38 returns the bucket to the normal digging position shown in solid lines in FIG. 2. To facilitate side dumping of material from bucket 14, the bucket may be provided with a spout-shaped end 14*a* which extends laterally beyond the side dumping pivot 21.

The hydraulic ram 38 is adapted to be operated through a conventional valve, not shown, which can be actuated to admit fluid to the ram to extend or retract the ram and also to lock the fluid in the ram, whereby the ram will hold the loaded bucket against bouncing during transit of the loader.

It will be appreciated that when the three sets of guides, as previously described, are interengaged, they accept and resist all moments of force acting on the bucket 14 during normal forward and digging operations, except those in a pure side tipping and dumping direction, thereby preventing distortion of the bucket and preventing transmission of these moments of force to the side dumping pivot 21 or to the hydraulic ram 38 so that these elements are protected against damage. By so preventing distortion of the bucket and preventing transmission of the major forces and stresses to the dumping pivot and the hydraulic ram, it has been found that a latch mechanism for holding the bucket against side dumping during forward dumping and digging is not necessary and that the side dumping ram is sufficient to hold the bucket in normal position against any minor forces that might be imposed on the bucket in the side tipping direction.

While one form of the invention has been shown and described, it will be appreciated that this is for the purpose of explanation and that changes and modifications may be made therein without departing from the spirit and scope of the invention.

I now claim:

1. In a loader of the class described, a bucket carrier, a bucket having a front digging side, means pivoting one end of said bucket on said carrier for pivotal movement about a pivot axis extending longitudinally of said loader whereby the bucket may be tipped sideways, a ram extending between said bucket and carrier for tipping said bucket about said pivot axis, tongue and groove guide means along the rear side of said bucket and carrier remote from the front digging side and also on the end of said bucket and carrier remote from said pivot axis which interengage with the tongue extending into the groove when said bucket is in a normal untipped position relatively to said carrier, said tongue and groove guide means extending in a direction substantially perpendicular to said pivot axis whereby when said tongue and groove means are interengaged they accept all stresses and forces acting on said bucket during normal forward and digging operations except those forces which are in a purely side tipping direction.

2. In a loader of the class described, a bucket carrier, a bucket having a front digging side, means pivoting one end of said bucket on said carrier for pivotal movement about a pivot axis extending longitudinally of said loader whereby the bucket may be tipped sideways, a ram, means connecting said ram to said bucket and to said carrier for tipping said bucket about said pivot axis, a pair of tongue and groove guide means along the rear side of said bucket and carrier remote from the front digging side which interengage with the tongue means extending into the groove means when said bucket is in a normal untipped position relatively to said carrier, said tongue and groove guide

means extending in a direction substantially perpendicular to said pivot axis, one of said tongue and groove guide means being below the means connecting said ram to said bucket whereby when said tongue and groove means are interengaged they accept all stresses and forces acting on said bucket during normal forward and digging operations except those forces which are in a purely side tipping direction.

3. In a loader of the class described, a bucket carrier, a bucket having a digging side, means pivoting one end of said bucket on said carrier for pivotal movement about a pivot axis extending longitudinally of said loader whereby the bucket may be tipped sideways, a ram extending between said bucket and carrier for tipping said bucket about said pivot axis, cooperating tongue and groove guide means on the rear side remote from the digging side and on the end of said bucket and carrier remote from said pivot axis which interengage with the tongue means extending into the groove means when said bucket is in a normal untipped position relatively to said carrier, said tongue and groove means extending in a direction perpendicular to said pivot axis whereby when interengaged they accept all stresses and forces acting on said bucket during normal forward and digging operations except those forces which are in a purely side tipping direction.

4. In a loader of the class described, a bucket carrier, a bucket having a digging side, means pivoting one end of said bucket on said carrier for pivotal movement about a pivot axis extending longitudinally of said loader whereby the bucket may be tipped sideways, a ram extending between said bucket and carrier for tipping said bucket about said pivot axis, cooperating tongue and groove guide means on the rear side remote from the digging side and on the end of said bucket and carrier remote from said pivot axis which interengage with the tongue means extending into the groove means when said bucket is in a normal untipped position relatively to said carrier, said tongue and groove means extending in a direction perpendicular to said pivot axis whereby when interengaged they accept all stresses and forces acting on said bucket during normal forward and digging operations except those forces which are in a purely side tipping direction, and cooperating cam surfaces on said tongue and guide means for centering said bucket on said carrier as said bucket is moved to normal untipped position.

5. In a loader of the class described, a bucket carrier, a bucket, means pivoting one end of said bucket on said carrier for pivotal movement about a pivot axis extending longitudinally of said loader whereby the bucket may be tipped sideways, a ram, means connecting said ram to said bucket and carrier for tipping said bucket about said pivot axis, guide means along the rear edge of said bucket and the rear edge of said carrier and also on the end of said bucket and carrier remote from said pivot axis which interengage when said bucket is in a normal untipped position relatively to said carrier and accept all stresses and forces acting on said bucket during normal forward and digging operations except those forces which are in a purely side tipping direction, said ram connecting means securing said ram to the rear guide means.

References Cited by the Examiner

UNITED STATES PATENTS

1,393,169	10/1921	Schlatter et al.	298—17.7 X
1,909,341	5/1933	Galanot	298—17.7 X
2,679,326	5/1954	Isaksen	214—140

FOREIGN PATENTS

916,939	9/1946	France.

HUGO O. SCHULZ, *Primary Examiner.*