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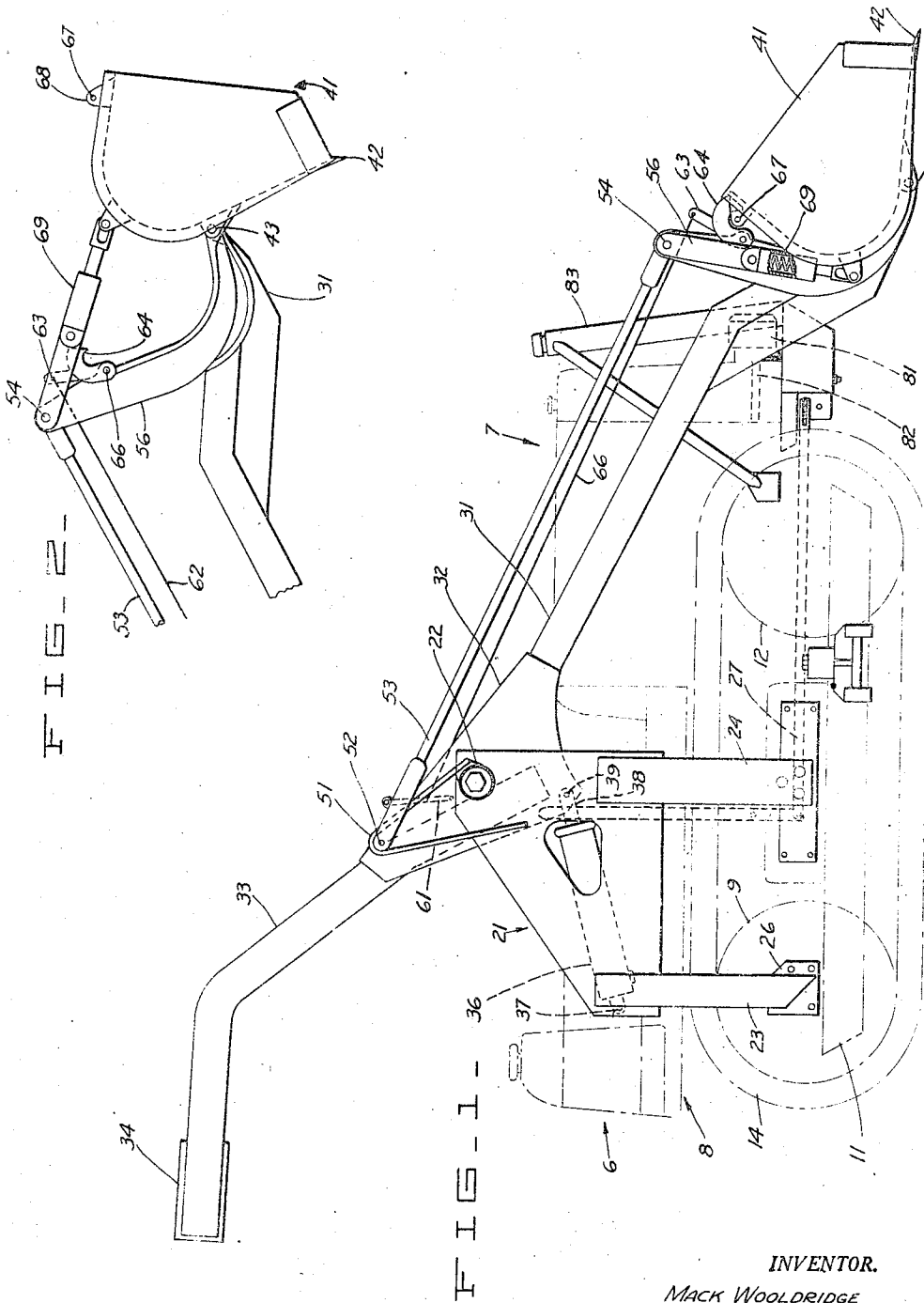
M. WOOLDRIDGE

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VEHICLE MOUNTED LOADER

Filed July 16, 1945

3 Sheets-Sheet 1



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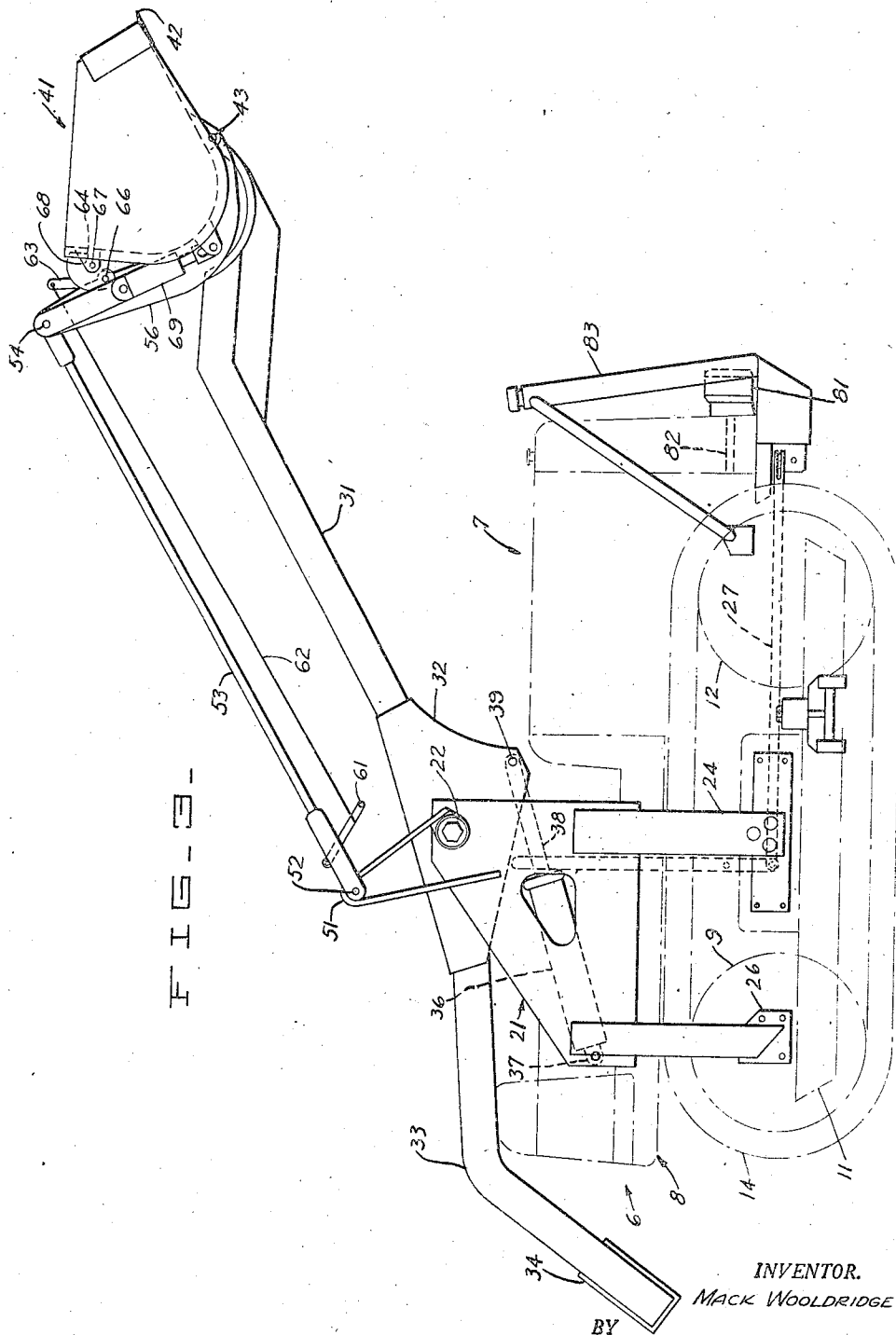
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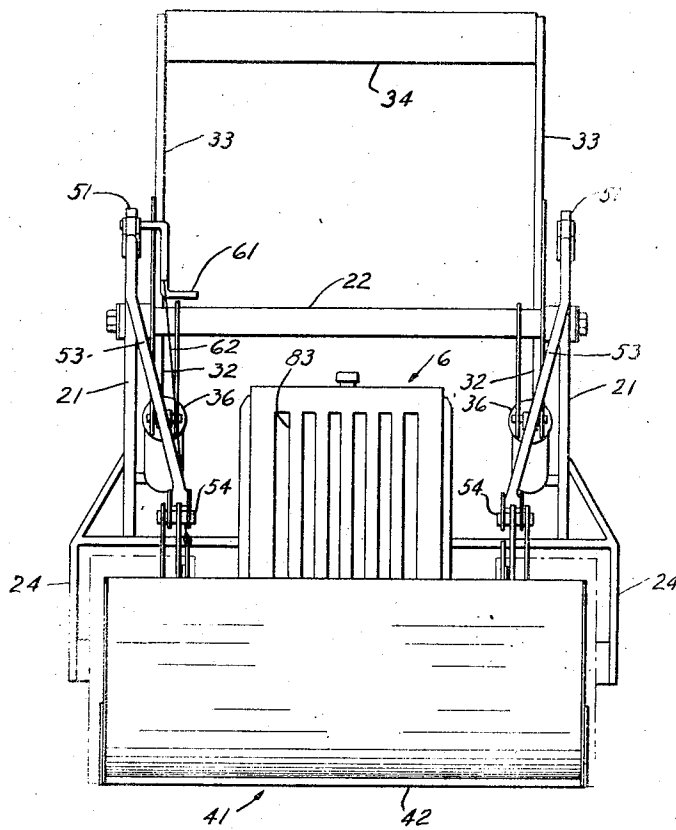


FIG. 4.

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VEHICLE MOUNTED LOADER

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2 Claims. (Cl. 214-140)

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This invention relates to loaders.

It is in general the broad object of the present invention to provide an improved loader.

Another object of the present invention is to provide a loader construction in which the tool is maintained in substantially the same relative horizontal position in all positions of lift.

The further object of the present invention is to provide a loader in which a bucket can be readily interchanged with a bulldozer blade, a lift-fork or other load handling tool.

A further object of the present invention is to provide a loader in which the lift is effected by means of a frame including beams so arranged as to provide a parallelogram, thus enabling the tool to be maintained level in all positions of lift.

An additional object of the present invention is to provide a loader in which a lift frame is provided movable about a pivot, all weight factors about the pivot being counterbalanced so that substantially the only power application required during lift is that utilized to raise the actual load present on the tool.

An additional object of the present invention is to provide a loader construction including a rigid track frame mounting which eliminates track oscillation and provides a steady mount for the loader, one in which weaving is absent when the loader is moved with the load in a high lift position.

A further object of the present invention is to provide a loader construction suitable for application to a track-type tractor and in which the entire load is carried on the track frame of the tractor, and is so applied to the track frame that it is evenly distributed over the full length of the tracks.

The invention includes other objects and features of advantage, some of which, together with the foregoing, will appear hereinafter wherein the present preferred form of loader construction of this invention is disclosed.

Referring to the drawings accompanying and forming a part hereof,

Figure 1 is a side elevation illustrating the loader mounted upon one form of track laying type tractor.

Figure 2 is a fragmentary side elevation showing the bucket in a lifted and load-discharging position.

Figure 3 is a side elevation of the loader showing the beams in elevated position.

Figure 4 is a front view of the loader on a tractor.

Referring to the drawings, a track laying type tractor is generally indicated by numeral 6. This includes an engine, generally indicated by numeral 7 mounted on a main frame indicated by numeral 8. A rear drive sprocket 9 is provided on each side of the main frame, a track frame 11

extending forwardly from each sprocket and providing a mounting for forward idler sprocket 12. A chain or track 14 is extended about each associated main sprocket and idler sprocket to provide a movable track. The tractor construction utilized is well known in the art, and that described is typical of various suitable tractor devices of the track laying type now available. In place of a tractor, one can employ any suitable dirigible vehicle.

Mounted over each track frame is a triangular plate 21, one being provided over each track frame and the two plates being joined together by a tube 22 secured to an upper portion of each plate. To support each of the plates, arms 23 and 24 are extended from brackets 26 and 27. Bracket 26 is mounted upon the main drive sprocket housing, while bracket 27 is provided upon the track frame 11. A cross-member 25 is provided to join arms 24 together (Figure 4).

Mounted for oscillation about tube 22 are a pair of beams 31 joined at their rearward ends to plates 32 which are mounted upon the tube 22. Extending rearwardly from plates 32, are another pair of arms 33, joined together at the rear ends by a counterweight 34. To move the arm structures about the pivot support or tube 22, I have shown the hydraulic cylinders 36, secured at one end to a bracket 37 on each plate 21 and having a piston (not shown) from which a piston rod 38 extends to engage plate 32 at 39. A pair of cylinders 36 is provided, one on each side of the tractor, the cylinders preferably being of the double-acting type so that the arms can be raised and lowered positively when supplied with fluid under pressure, as will presently be described.

At the forward end of arms 31 is positioned a bucket, generally indicated by numeral 41, which represents the lifting tool utilized. The bucket, as has been previously indicated, can be replaced by a fork, a blade, or other tool as desired. In the form shown, the bucket is provided with a scraper edge 42 so that, upon the forward movement of the tractor, earth, or other material, is loaded into the bucket. The bucket is pivoted as at 43, on an end of each of the arms 31, which curve downwardly at their forward ends to fit under and permit installation of a bucket of maximum size.

To maintain the tool substantially level in all positions of use and lift, an auxiliary frame 51, is mounted upon each plate 21. Pivotaly connected at one end to each auxiliary frame 51 as at 52, is a rod 53 which extends forwardly to a pivot connection 54 with a lever 56, the lever extending to the pivot connection 43. The effective length of rods 53 and arms 31 from their pivot support to the tool, and the spacing of the pivots and the connection to the tool is such as to provide a parallelogram, the two long sides of

which are respectively provided by arms 31 and rods 53 and the short sides of which are provided by lever 56 at one end and by auxiliary support 51, at the other end. It will be observed, upon a comparison of the position of the bucket structure shown in Figure 1 with the position of the bucket structure shown in Figure 3 that, as the bucket is lifted, the load, instead of being tipped forwardly as is usually the case, is maintained level and is, in fact, rocked backward slightly so that, instead of the load tipping out as the tractor is moved, the load is retained in the bucket.

With the bucket in a lift position, as in Figure 3, the load is released by pulling rearwardly upon lever 61, pivoted upon one of the rods 53, the lever 61 being connected by wire 62 to a latch 63 associated with the bucket. Latch 63 includes a tongue 64 pivoted on one of the levers 56 as at 65 and normally engaged with a rod 67 carried upon an ear 68. (Figure 2.)

To prevent too great a shock load application to the parallelogram lever structure upon release of the bucket, a shock absorber structure, generally indicated at 69 is provided between the pivot point 54, and the bucket proper.

In place of mounting a bucket, one can place a bull-dozer blade, lift-fork or other material handling tool in position.

The rigid mounting of plates 21 upon the truck eliminates track oscillation and provides a steady mounting so that when the tractor is moved with a load, even in high lift position, the load does not weave back and forth. Further, the load application is applied to the track frame and is evenly distributed over the full length of the truck. In this connection, it should be pointed out that the particular mounting for plates 21 is shown as applied to a particular type of tractor and that with other types of tractors one can readily mount plates 21 so that full and equal load application to the track frame is secured. Further, one is able to lift the load to a relatively great height—the lift position shown in Figure 3 is not the full position provided in the structure depicted, the upper lift positions being limited by the size of the illustration.

To provide the hydraulic fluid, I have shown a pump structure at 81 as driven by a front take-off shaft connected to the engine as at 82. The radiator guard structure is shown as 83 and is part of the tractor. This structure is usually made of hollow tubular members to contain the hydraulic fluid, so that this portion of the structure may be readily mounted as a separate unit on the tractor.

The structure described possesses numerous advantages in structure and in operation. For example, the main frame of the lifting forks is tied together at three places, at the front, at the middle by tube 22 and at the rear by weight 34. This imparts stability, enabling the structure to be moved over the earth while a load is in an elevated position. Also, reaction forces from the hydraulic cylinders 36 are isolated in the separate mounting frame and are not transmitted to the tractor.

The parallelogram system of levers is unique, enabling the bucket or other tool to be lowered below the ground line supporting the tractor, the levers coating to present the edge of the tool in a digging position so the tool can be utilized to dig a trench which the tractor straddles. The snubber structure acts not only to snub release of the bucket but to pull the bucket, hinged at its midpoint, back into position. This obviates striking

of the bucket on a truck or on the earth to return it to loading position.

I claim:

1. A tractor having a main frame and a pair of parallel track frames along two sides thereof, a support frame positioned over each track frame, means supporting each support frame from a track frame and substantially independent of the main frame, a tool comprising a scoop-like bucket having a cutting tool along its forward edge, a first and a second arm each engaged at one end with said tool and extending to the rear of said tractor and being hingedly supported on a support frame at a point intermediate the ends of the arm, a counter-weight at the other end of the first and second arms, and a third arm and a fourth arm each hinged at one end on a support frame and extending forwardly above said first and said second arm, and means connecting the other end of said third and fourth arms to said tool and including a link extending from each of said third arm end and said fourth arm end to the cooperatively adjacent end of said first and said second arms to provide a parallelogram linkage support for said tool, means for moving said links to raise and lower the tool in substantially the same position of adjustment, means supporting said bucket for rotation on the forward ends of said first and said second arms about a pivotal axis extending transversely across said bucket about midway thereof, and spring snubber means for resisting rotation of said bucket and biasing it toward a loading position.

2. In combination, a dirigible vehicle; a first and a second arm extending fore and aft of said vehicle; a counterweight at the after end of said arms; a tool mounted at the forward end of said arms; support means on each side of said vehicle, hingedly supporting said arms intermediate the ends thereof; means for moving said arms up and down with respect to said vehicle and each including a cylinder mounted on each support means, a piston therein having a piston rod engaged with said first arm and with said second arm; a third and a fourth arm, hinged at one end on said support means and respectively overlying the plane of said first and said second arms; and a link at the forward end of the first and third arms and the second and fourth arms and joining the respective arm pairs together to provide a parallelogram lever system for supporting and moving said tool.

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