Dec. 2, 1969 W. H. MEADE ET AL 3,481,056

TRACTOR BLADE-BUCKET

Filed Dec. 29, 1966 2 Sheets-Sheet 1

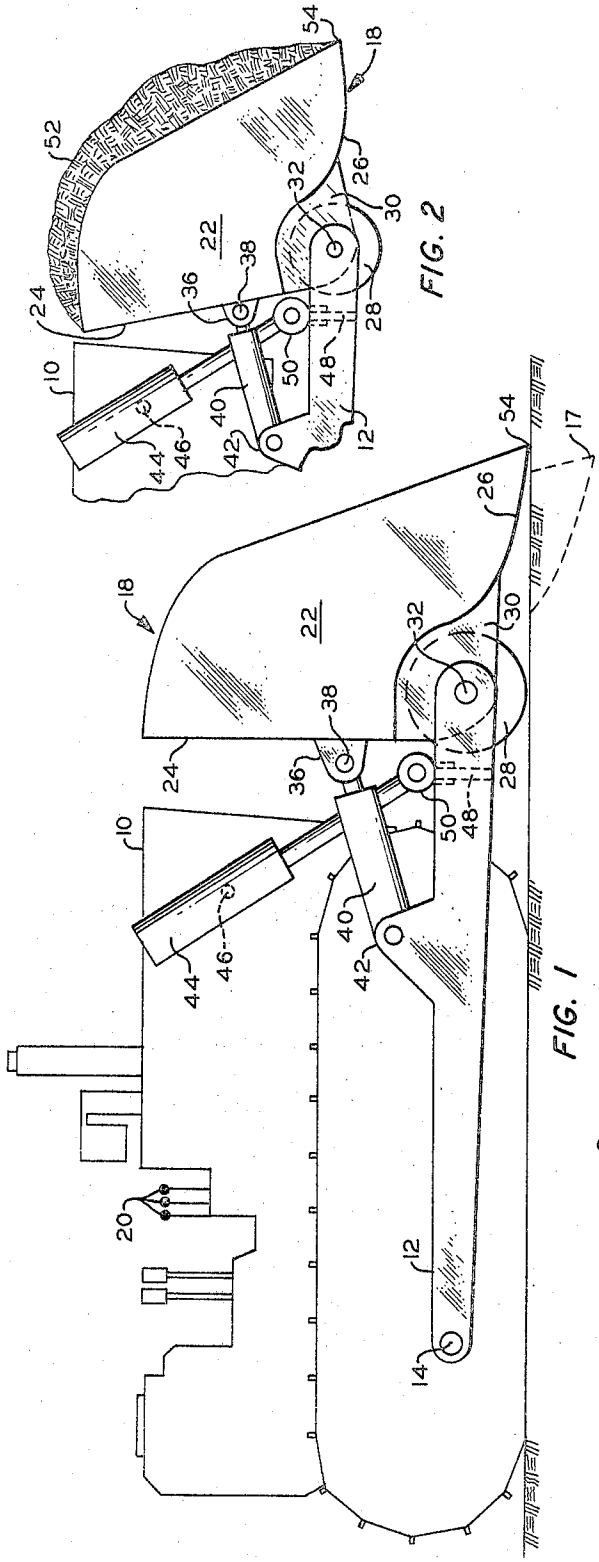


FIG. 1

FIG. 2

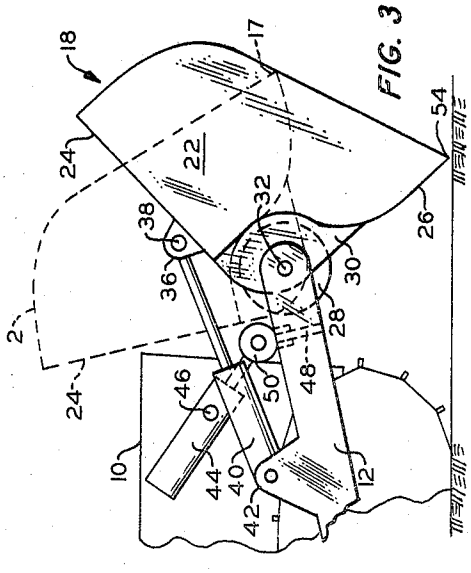


FIG. 3

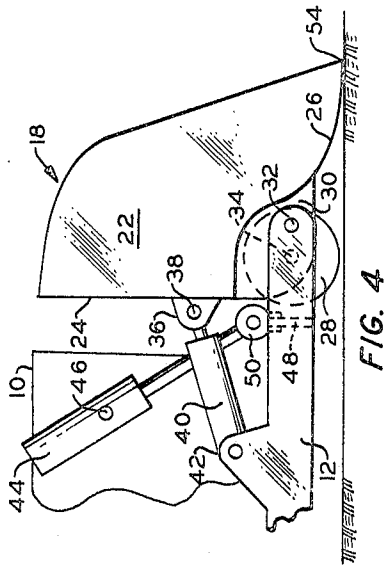


FIG. 4

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TRACTOR BLADE-BUCKET

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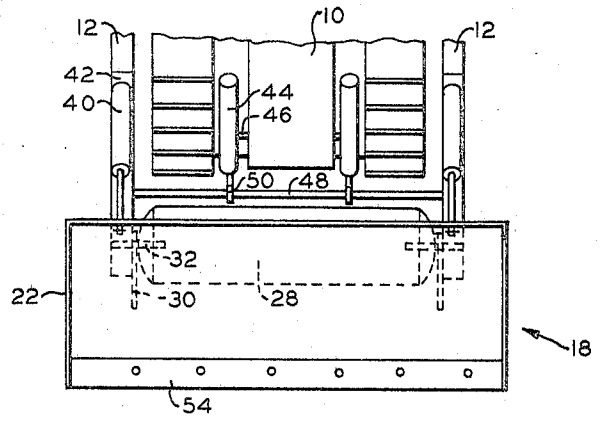


FIG. 5

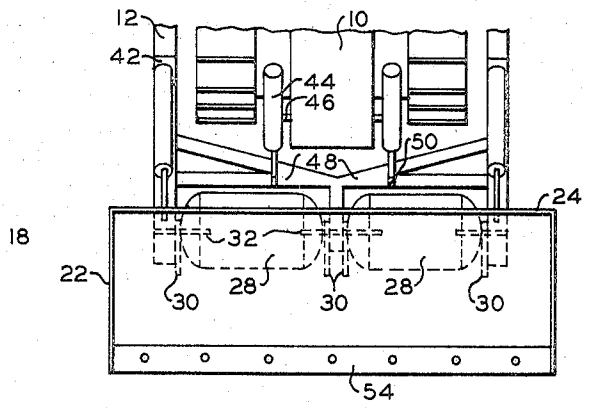


FIG. 6

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TRACTOR BLADE-BUCKET

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U.S. Cl. 37—117.5 7 Claims

ABSTRACT OF THE DISCLOSURE

A combination blade-bucket for a tractor, bulldozer, and the like is provided which is substantially completely supported by wheels or drums pivoted in brackets under a recessed section of the bucket.

In earth-moving machines in which the blade and/or bucket is positioned forward of the prime mover, as on the front end of a track-type or wheeled-type vehicle, most if not all of the weight of the bucket and/or blade and its load are supported from and borne by a framework extending forward of the prime mover. Simultaneously cutting (blading) the earth and supporting the earth accumulating in the blade and/or bucket requires a great deal of horsepower in the prime mover. In an operation in which earth is to be moved a considerable distance, such machines are not practical, efficient, or economical.

The present invention supports a uniquely designed blade-bucket by a roller, drum, or wheels, depending upon the weight to be carried. The blade-bucket supports the weight of the load and substitutes rolling friction for sliding friction on the ground, thereby rendering it feasible to use about 30 to 50 percent less horsepower in earth-moving operations than required by presently known machines for such operations.

The machine of the invention serves as a bulldozer, as a transporter, and as a loader. It is adaptable to any type of tractor, either wheel-driven or track-type vehicle.

The invention is better understood by reference to the accompanying schematic drawing of which FIGURE 1 is a side elevation of the construction tool mounted on a crawler tractor; FIGURE 2 is a similar view of the tool of FIGURE 1 loaded with earth; FIGURE 3 is a similar view to FIGURE 2 illustrating operational positions of the tool; FIGURE 4 is a side elevation of another arrangement of the tool; and FIGURES 5 and 6 are partial plan views of a tractor to which the bucket-blade is mounted.

Referring to the drawing, a crawler or track-type prime mover **10** (conventional in the art) is provided with a pair of support beams **12** mounted one on each side of the machine from pivots **14** and rigidly connected by transverse tie beam **48**. Beams **12** extend forwardly of the machine to provide attaching means for blade-bucket **18**. Operating controls **20** on the tractor are conventional controls for operation of the machine and the blade-bucket.

Blade-bucket **18** comprises a pair of upright side members **22**, a back member **24**, and a bottom member **26**. Side members **22** are arcuate along their lower edges, being curved upwardly and rearwardly (upwardly convex or inwardly concave), and bottom member **26** curves to fit this contour to provide a recess for wheels, drums, or rollers **28**, the rolling supporting means for blade-bucket **18**.

A pair of mounting brackets **30** (2 pairs in FIGURE 6) are rigidly affixed to back **24** by welding or other means and spaced thereon inwardly from each side **22** so as to be positioned inwardly adjacent beams **12**.

Brackets **30** are pivoted on (or in) beams **12** at pivots **32**. Drums **28** have a common pivot **32** with brackets **30** in the structure of FIGURES 1–3 and 5–6. However, drums **28** may be pivoted separately as at **34** in FIGURE 4 to provide a variation in rotational handling of a load in bucket **18**. Attaching brackets **36** welded to the rearward side of back member **24** provide pivot means **38** for attaching hydraulic rams **40**, the other ends of which are pivoted at **42** on beams **12**. Rams **40** provide rotation of bucket **18** on pivots **32** as shown in FIGURES 2 and 3. A pair of rams **44** are pivoted at **46** on the tractor **10** (or tractor frame) and also pivoted at **50** on tie bar **48** which rigidly links beams **12**, as shown in FIGURES 5 and 6.

Drum or wheels **28** may comprise any number of units, such as a pair of drums as in FIGURE 6. These drums may be solid or hollow and may be equipped with cleats, spikes, or sheep's foot-type tampers in applications where needed. The ends of drum(s) **28** are rounded to permit easier turning of the machine when the blade-bucket is full of material.

FIGURES 2 and 3 demonstrate the blade-bucket's articulation and FIGURE 3 particularly shows articulation for pushing material up banks or inclined surfaces and dumping material over a fill or into a hopper. The loaded blade-bucket with load **52** is shown in FIGURE 2.

A hardened steel cutting bar **54** is bolted or otherwise attached to the forward edge of bottom **26**. Hydraulic controls **20** simultaneously or independently actuate rams **44** to raise and lower beams **12** and rams **40** to control the blade tilt and articulation of blade-bucket **18**.

The invention described herein enables a prime mover to economically transport more material over a greater distance as compared to a conventional blade attached to an identical prime mover with the same horsepower and using the same amount of a given fuel per hour.

Certain modifications of the invention will become apparent to those skilled in the art and the illustrative details disclosed are not to be construed as imposing unnecessary limitations on the invention.

We claim:

1. A materials handling device comprising in combination

(a) a combination blade-bucket comprising in loading position

(1) a pair of generally upright and parallel side members;

(2) a generally upright back member connecting said pair of generally upright and parallel side members adjacent their rearward edges; and

(3) an arcuate bottom member connecting the lower edges of said pair of generally upright and parallel side members and attached to the lower edge of said back member to form a bucket therewith, said bottom member curving substantially upwardly and rearwardly in its rearward area to form a downwardly opening concave recess, extending transversely from one of said side members to the other of said side members, and being provided with a sharp forward edge;

(b) mounting brackets positioned in said recess and attached to a rearward section of said bottom member;

(c) rolling supporting means pivoted to said mounting brackets and extending transversely across substantially the entirety of said recess, said pivot of said rolling supporting means being forwardly of said back member and above the lowest portion of said arcuate bottom member, thereby positioning said rolling supporting means under said blade-bucket

within said recess so that it supports substantially all of the weight of a load on said blade-bucket; and

(d) a prime mover, a pair of generally parallel spaced-apart support beams pivotally attachable at their rearward ends to said prime mover, said mounting brackets being pivoted in the forward ends of said support beams.

2. The device of claim **1** wherein said mounting brackets and said rolling supporting means are pivoted on common pivots in said support beams.

3. The device of claim **1** wherein said mounting brackets are pivoted to said support beams forwardly of the pivot of said rolling supporting means.

4. The device of claim **1** including attaching means on the rear of said back member for rotating said blade-bucket on its pivot in said support beams and hydraulic means pivoted on each of said support beams and on the adjacent said attaching means for rotating said blade-bucket.

5. The device of claim **1** including

(e) first means for raising and lowering the forward ends of said support beams; and

(f) second means for rotating said blade-bucket on its pivots on said mounting brackets.

6. The device of claim **1** wherein said rolling supporting means comprises at least one drum extending generally parallel with the forward edge of said bottom member and substantially perpendicularly to said mounting brackets.

7. The device of claim **6** wherein said prime mover is a track-driven vehicle.

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