Nov. 6, 1945. C. A. ONOFRIO 2,388,436

MATERIAL LOADING DEVICE

Filed Oct. 4, 1944 2 Sheets-Sheet 1

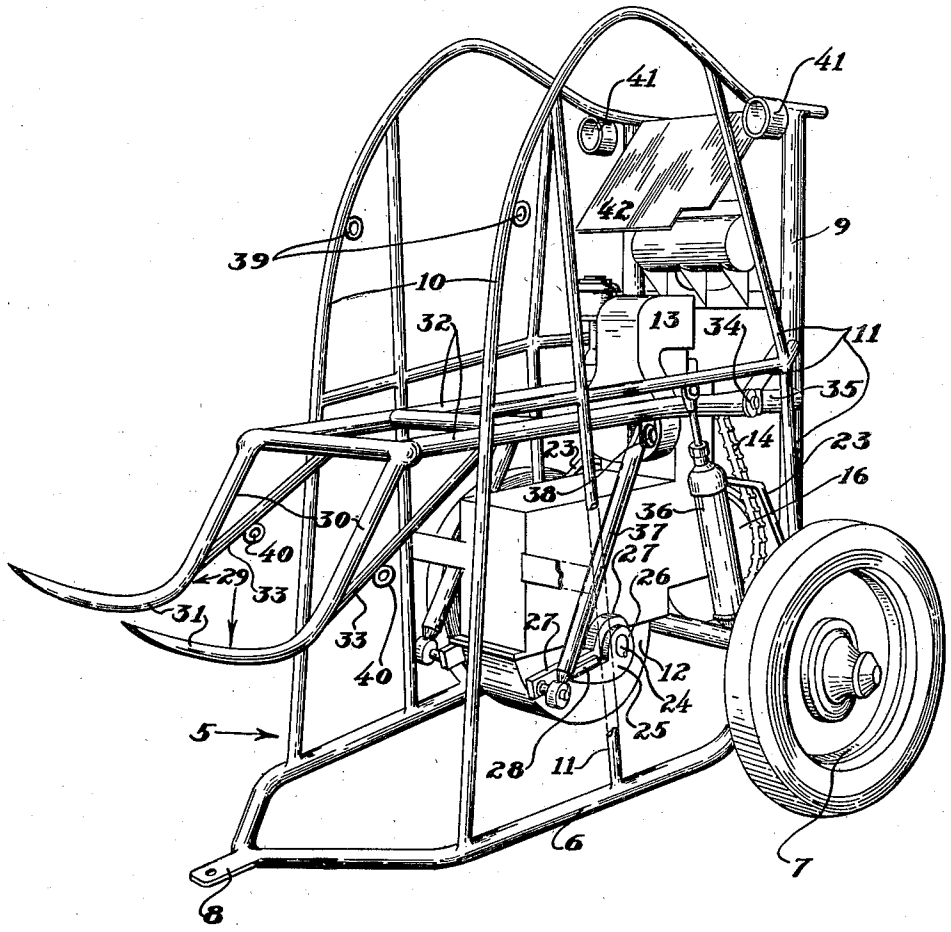


Fig. 1

INVENTOR.
CARMENO A. ONOFRIO
BY
Spear, Rawlings & Spear.
ATTORNEY

Nov. 6, 1945. C. A. ONOFRIO 2,388,436

MATERIAL LOADING DEVICE

Filed Oct. 4, 1944 2 Sheets-Sheet 2

Fig. 2

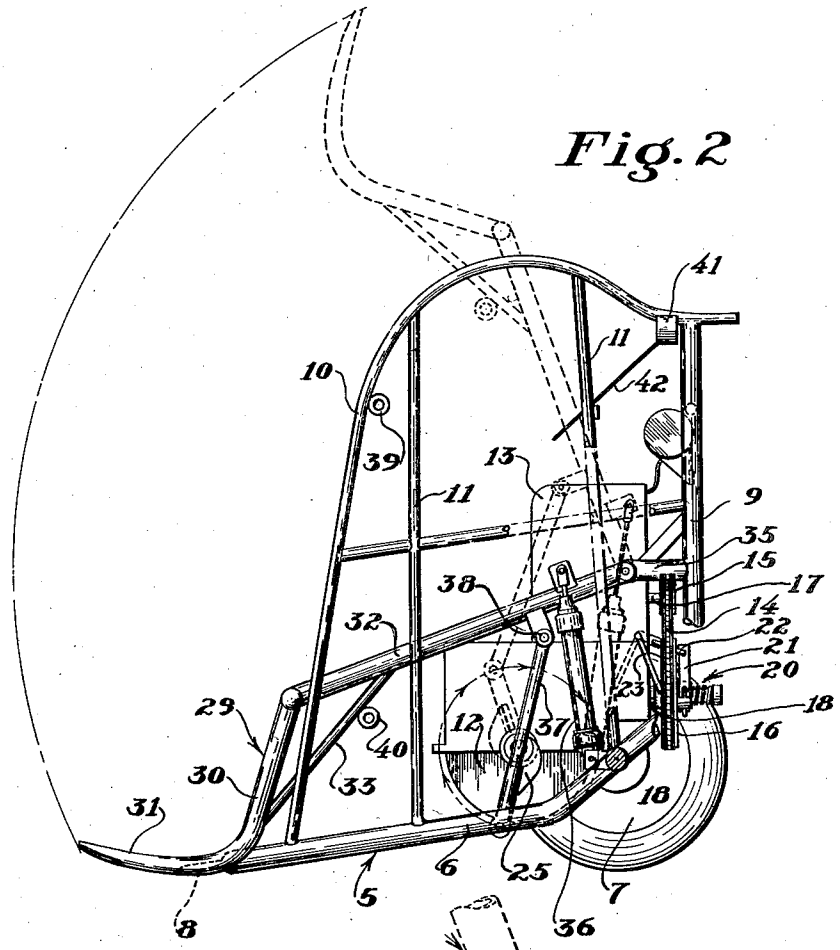
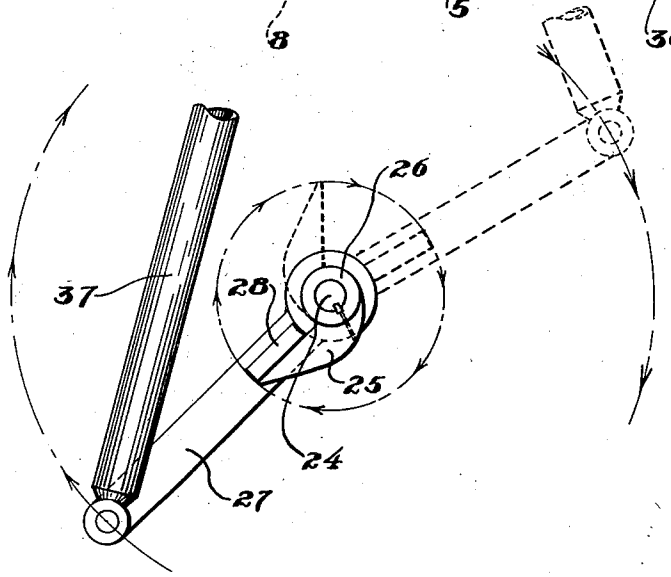


Fig. 3



INVENTOR.
CARMENO A. ONOFRIO
BY
Spear, Rawlings & Spear.
ATTORNEY

Patented Nov. 6, 1945 2,388,436

UNITED STATES PATENT OFFICE

2,388,436

MATERIAL LOADING DEVICE

Carmeno A. Onofrio, Gorham, N. H., assignor of one-half to Romeo Orino, Gorham, N. H., and one-eighth to John Orino, Rumford, Maine

Application October 4, 1944, Serial No. 557,093

10 Claims. (Cl. 214—131)

This invention relates to devices for use in handling various loads of which pulpwood may be taken as an example.

Pulpwood is commonly piled as it is cut and the individual logs are manually lifted from such piles and loaded in the truck or other vehicle. This is particularly difficult with the larger logs which are generally located at the bottom of the pile. As some of these are too large for the crew to handle, a number of logs are frequently left and wasted for lack of efficient and economical loading means.

In accordance with my invention, I provide a trailer in which is mounted an engine, a shaft, and clutch controlled means to connect the shaft to the engine and to rotate the shaft at a predetermined slow speed. A lifting element is pivotally connected to the trailer to swing upwardly from a loading position adjacent one of its ends to a dumping position above it, and preferably the trailer is formed to establish a chute directed towards the other end of the trailer to receive loads discharged from the lifting element. I provide a connection between the lifting element and the shaft that automatically disengages when the lifting element is in its dumping position so that gravity is effective to cause the return of the lifting element to its loading position. The lifting element is formed so that when in its dumping position, the load is discharged therefrom and the dumping position is such that the lifting element is urged towards its loading position by gravity.

Preferably this connection consists of an arm mounted on the shaft for rotation independently thereof and having a portion engageable by a dog fast on the shaft. The arm is pivotally connected to a second arm pivotally attached to the lifting element and by this construction the dog picks up the first arm and swings it upwardly to raise the lifting element from its loading to its dumping position and to continue the turning of the arm. As the rate of rotation of the shaft is relatively slow, the connection between the shaft and the lifting means becomes inoperative after the lifting element is raised to its dumping position, as the first arm is then turned more rapidly than the dog under the influence of the load lifting element as it drops back to its loading position. This affords ample time for the operator to disengage the clutch.

In the accompanying drawings I have shown my invention as embodied in a log loader, particularly adapted for use in handling pulpwood and from which the novel features and advantages of my invention will be readily apparent.

In the drawings:

Fig. 1 is a perspective view of my device as viewed from the front.

Fig. 2 is a side view of the loader with the load lifting element in its loading position and with the load lifting element shown in dotted lines in its dumping zone, and

Fig. 3 is a fragmentary view showing the lifting dog and arm.

At 5 I have indicated generally a trailer. While the trailer may be otherwise constructed, I have shown it as consisting of framework including a base 6 extending forwardly of the wheels 7 and formed as at 8 to receive a trailer hitch. The base members 6 are formed to establish uprights 9 connected by side members 10 extending from the upper ends of the uprights 9 to the base 6 adjacent its front end. The framework is braced as at 11 to insure that the trailer combines sturdiness with lightness and weight.

In accordance with my invention, I mount in the trailer a gear reduction unit 12 and an engine 13 with a chain 14 connecting the sprockets 15 and 16 on the power shaft 17 of the engine and on the input shaft 18 of the reduction unit, respectively. The sprocket 16 is adapted to be coupled to the shaft 18 by a clutch generally indicated at 20. The shifter element 21 of the clutch 20 is connected by a link 22 to a clutch control 23, the handles of which are disposed on opposite sides of the trailer 5 so that the clutch 20 may be conveniently engaged or disengaged by an operator on either side of the trailer.

The output shaft 24 of the gear reduction unit is disposed transversely of the trailer and has a dog 25 keyed to each of its ends. The hub part 26 of the dogs 25 serves as a bushing to support one end of the arms 27 so that they may turn independently of the shaft 24. Each arm 27 has a shoulder 28 engageable by the dogs 25 as the shaft rotates.

I have shown the lifting element as comprising a load support 29, the arms of which are downwardly disposed as at 30 and upwardly disposed at their ends as at 31 to establish a fork supported by a pair of interconnected booms 32 and braced as at 33. The booms 32 are located between the sides established by the side members 10 and are pivotally connected as at 34 to braced pivot posts 35 on the uprights 9.

As shown in Fig. 2, the lifting element has a loading position in which it is supported on the ground adjacent the front end of the base 6 and

a dumping position shown in dotted lines above the trailer. The shape of the load support **29** is such that when raised into a dumping zone as indicated by its dotted line position of Fig. 2, the portions **30** are downwardly inclined towards the rear of the trailer so that the log or other load supported thereby rolls therefrom under the influence of gravity. The side members **10** are curved upwardly towards the dumping position of the lifting element to establish a chute for the dumped load. Shock absorbers **36** mounted on the trailer are connected to the booms **32**.

A second arm **37** is pivotally connected as at **38** to each of the booms **32** and to each of the arms **27** so that as the arms **27** swing about the shaft **24**, the lifting element is raised and lowered between loading and dumping positions. In the loading position shown in Fig. 2, the dogs **25** are in engagement with the shoulders **28** on the arms **27** to cause the lifting element to swing upwardly towards its dumping position. When the load lifting element is raised through the dumping zone until the arms **27** have passed through their vertical position as indicated in Fig. 3, a dumping position is established in which the influence of gravity on the lifting element urges it back towards its loading position and causes the arms **27** to continue to turn. As the drive through the reduction unit causes a slow rotation of the shaft **24**, the influence of gravity results in the shoulders **28** becoming disengaged from the dogs **25** as the load lifting element drops back to its loading position so that an ample opportunity is provided for the disengagement of the clutch **20**.

The side members **10** are provided with eyes **39** with which similar eyes **40** on the braces **33** of the lifting element register when the lifting element is in an intermediate position. By inserting a bar or locking pins (not shown) through the eyes **39**, **40** when in that position, a towing position of the trailer is established.

The uprights **9** are provided with cylindrical supports **41** to receive poles or the like, not shown, in the event that it is desired to extend the chute established by the downwardly and rearwardly inclined portions of the side members **10**. A plate **42** protects the engine from falling objects.

By this construction I am able to provide a light-weight, sturdy trailer that may easily be towed when needed. When disconnected from the towing vehicle, it is positioned so that logs may be rolled onto the lifting element and dumped therefrom into the vehicle. In use the engine is continued in operation and when the lifting element is loaded, the clutch **20** is engaged so that the dogs **25** pick up the arms **27**. When the lifting element is raised through its dumping zone into its dumping position, the load dumps and gravity on the lifting element becomes effective to cause the arms **27** to continue to turn until the lifting element is again supported on the ground. After the lifting element drops back to its loading position, there is an appreciable interval in which the operator may disengage the clutch **20** or in which the dumped load may be replaced before the dogs **25** again come into a position to raise the lifting element.

While the embodiment of my invention which I have shown and described is particularly adapted for use in handling pulpwood, it will be understood that it may be readily adapted to efficiently handle various other loads.

What I therefore claim and desire to secure by Letters Patent is:

1. A material loading device comprising a trailer, an engine mounted in said trailer, a shaft journalled in said trailer, clutch controlled means to connect said shaft to said engine and to rotate said shaft at a predetermined slow speed, a dog on said shaft, a load shifting element pivotally supported by said trailer, an arm mounted on said shaft for rotation independently thereof and having a portion engageable by said dog as said shaft rotates, a second arm pivotally connected to said first arm and to said load lifting element so that when said dog engages said portion said lifting element is raised from a loading position adjacent one end of the trailer to a dumping position from which it will return by gravity and in which said first arm has passed through a vertical position, the rate of rotation of said shaft being sufficiently slow so that when said lifting element is in its dumping position, the influence of gravity thereon is effective to return said lifting element to said loading position and to rotate said first arm independently of said shaft.

2. The device of claim 1, in which the load lifting element is formed with load supporting surfaces disposed to present a chute along which the load may slide under the influence of gravity when the lifting element is in its dumping position.

3. The device of claim 1, in which the load lifting element is formed with load supporting surfaces disposed to present a chute along which the load may slide under the influence of gravity when the lifting element is in its dumping position and the trailer includes members downwardly and rearwardly inclined from a point adjacent the element when in its dumping position to establish a continuation of the chute.

4. In a material loading device, a trailer, a shaft rotatably supported by said trailer, a dog on said shaft, a load lifting element pivotally supported by said trailer, an arm mounted on said shaft for rotation independently thereof and having a portion engageable by said dog as said shaft rotates, a second arm pivotally connected to said first arm and to said load lifting element so that when said dog engages said portion said lifting element is raised from a loading position adjacent one end of the trailer to a dumping position from which it will return by gravity and in which said first arm has passed through a vertical position, and means to rotate said shaft at a sufficiently slow speed so that when said load lifting element is in its dumping position, the influence of gravity thereon is effective to rotate said first arm independently of said shaft and to return said lifting element to its loading position.

5. In a material loading device, a frame, a shaft journalled in said frame, a load lifting element pivotally supported by said frame for movement between a loading position adjacent one end of said frame to a dumping position above said frame, a connection between said lifting element and said shaft effective only to raise said lifting element from its loading to its dumping position, said dumping position being such that when said connection is ineffective, said lifting element is returned by gravity to its loading position.

6. In a material loading device, a frame, a shaft journalled in said frame, a load lifting element pivotally supported by said frame for movement between a loading position adjacent one end of said frame to a dumping position over said frame, a connection between said lifting element and said shaft, said connection including first

and second members, one of which is fast on said shaft and the other of which is supported thereby to turn about said shaft independently thereof and coacting to raise said lifting element except when gravity on said lifting element urges the second member to rotate in the same direction as said shaft, said dumping position of said lifting element being such that said second member is rotated by gravity in the same direction as said shaft, and said lifting element is returned to its loading position by gravity, and means to rotate said shaft at a speed slower than the rotation of said second member under the influence of gravity.

7. A material loading device comprising a trailer, an engine carried by said trailer, a shaft journalled in said trailer, clutch controlled means to connect said shaft to said engine and to rotate said shaft at a predetermined reduced speed, a dog on said shaft, a load lifting element pivotally supported by said trailer, an arm mounted on said shaft for rotation independently thereof and having a portion engageable by said dog as said shaft rotates, a second arm pivotally connected to said first arm and to said load lifting element so that when said dog engages said portion said lifting element is raised from a loading position in which it is supported on the ground adjacent one end of the trailer to an unloading position from which it will return by gravity and in which said first arm has passed through a vertical position, the rate of rotation of said shaft being sufficiently slow so that when said portion on said first arm disengages from said dog the rotation of said first arm is continued by the return of said load lifting element to its loading position under the influence of gravity.

8. A material loading device comprising a trailer, said trailer including a frame, the front end of which is adapted to be supported by the ground or attached to a towing vehicle, and the back part of which establishes a pair of uprights, and side members interconnecting the upper ends of said uprights to said front end, an engine supported by said trailer, a shaft rotatably supported by said trailer, clutch controlled means to rotate said shaft at a predetermined slow speed, a dog on said shaft, a load lifting element pivotally supported by said trailer between said side members and comprising a boom extending beyond said side members and being formed with a load supporting portion to be supported on the ground when in loading position and from which the load will move under the influence of gravity when said boom is swung upwardly into a predetermined dumping position, the upper edges of said side members being downwardly inclined towards said rear end to establish a chute for the load discharged from said loading supporting portion of said element, an arm mounted on said shaft for rotation independently thereof and having a portion engageable by said dog as said shaft rotates to swing said arm upwardly, and a second arm pivotally connected to said boom and to said first arm to cause the swinging of said first arm to swing said boom upwardly from its loading to its unloading position in which position said first arm passes through a vertical position, the rate of rotation of said shaft being sufficiently slow so that after said dog has raised said first arm to raise said lifting element to its dumping position, said arm is turned to its original position ahead of said dog as gravity returns said lifting element to its loading position.

9. The device of claim 8, in which the boom has an eye to receive a locking bar and the frame has an eye disposed to register with said boom eye when said lifting element is in an intermediate position to permit the locking bar to extend through the eyes to establish a locked position of the lifting element when the trailer is to be towed.

10. The device of claim 8, in which the uprights adjacent each side of the frame are provided with supports to receive members to permit the extension of the chute established by the upper edges of the side members.

CARMENO A. ONOFRIO.