

J. McCABE.
LOADING APPARATUS.
APPLICATION FILED JULY 16, 1907.

907,518.

Patented Dec. 22, 1908.

2 SHEETS—SHEET 1.

Fig. 1.

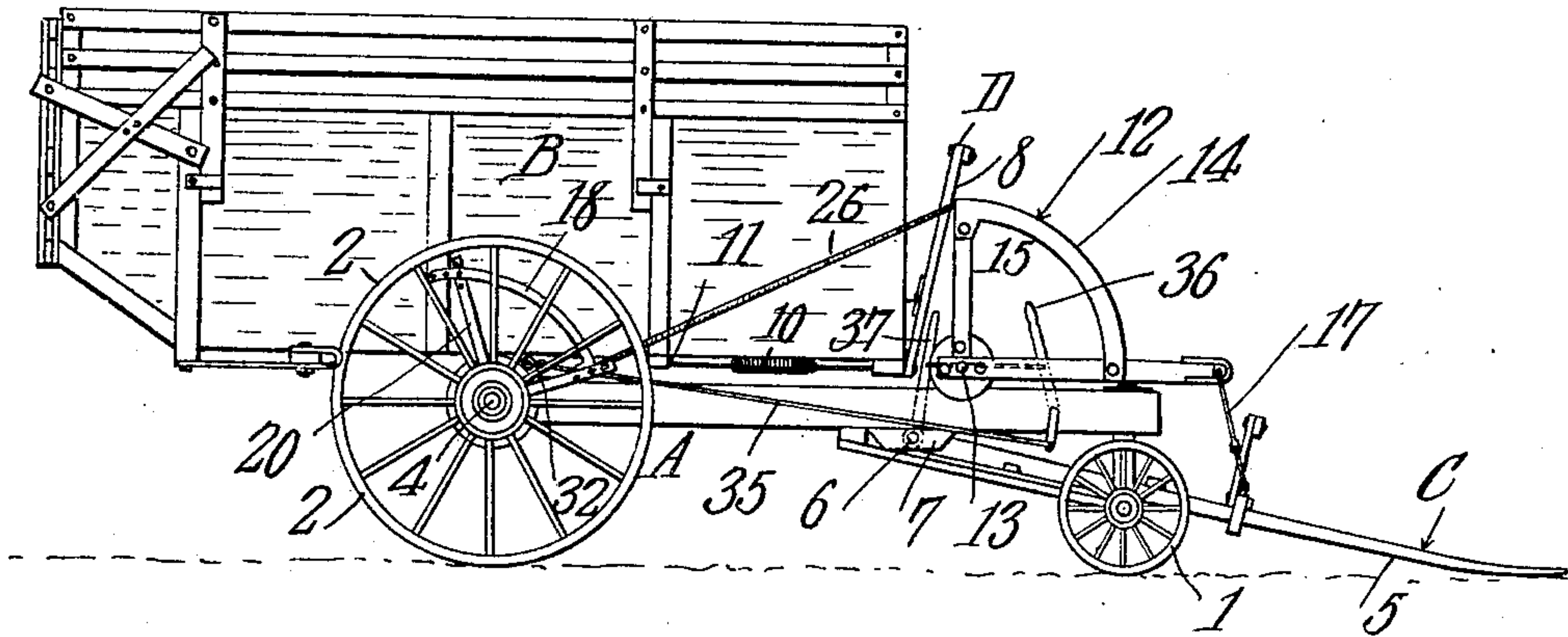


Fig. 2.

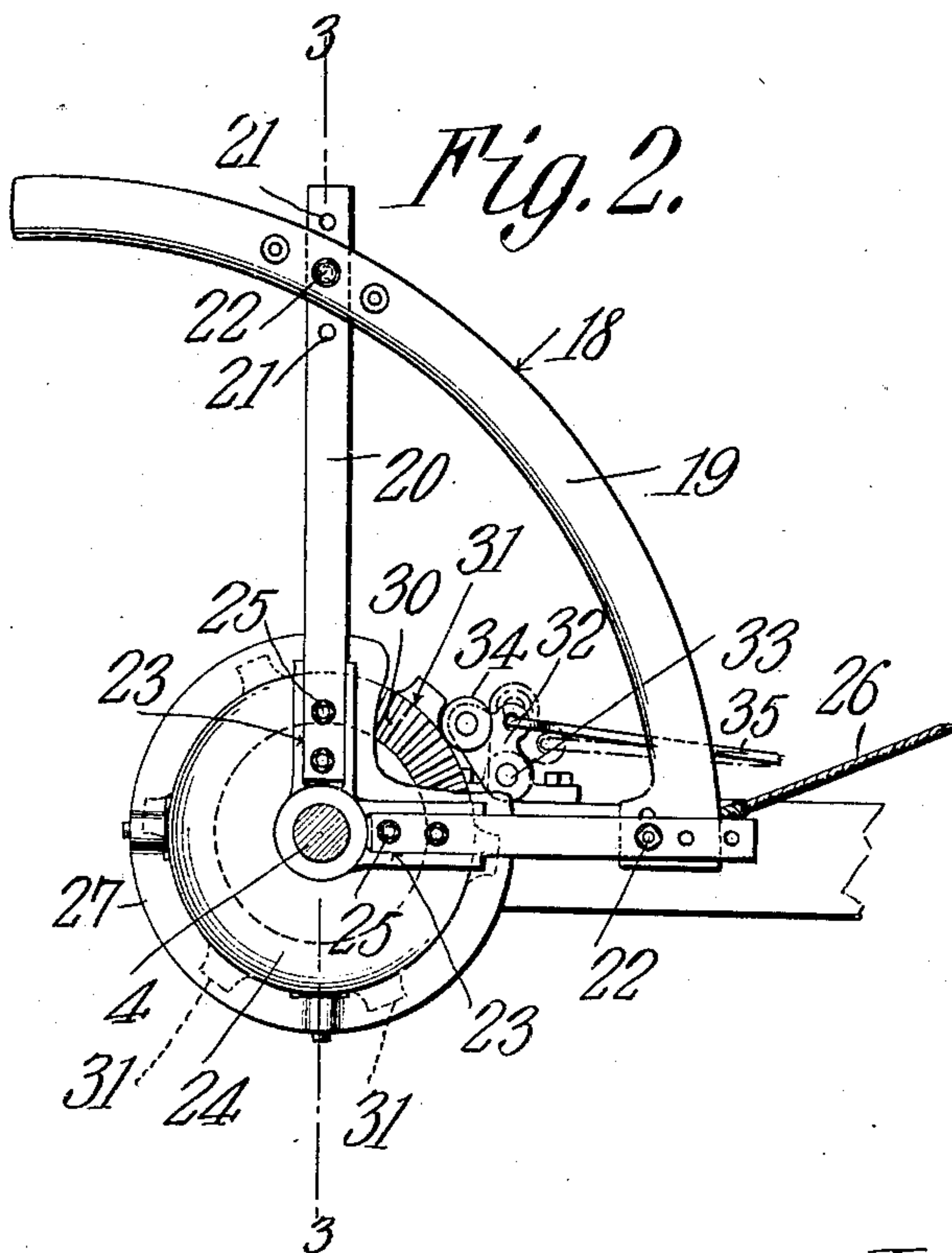
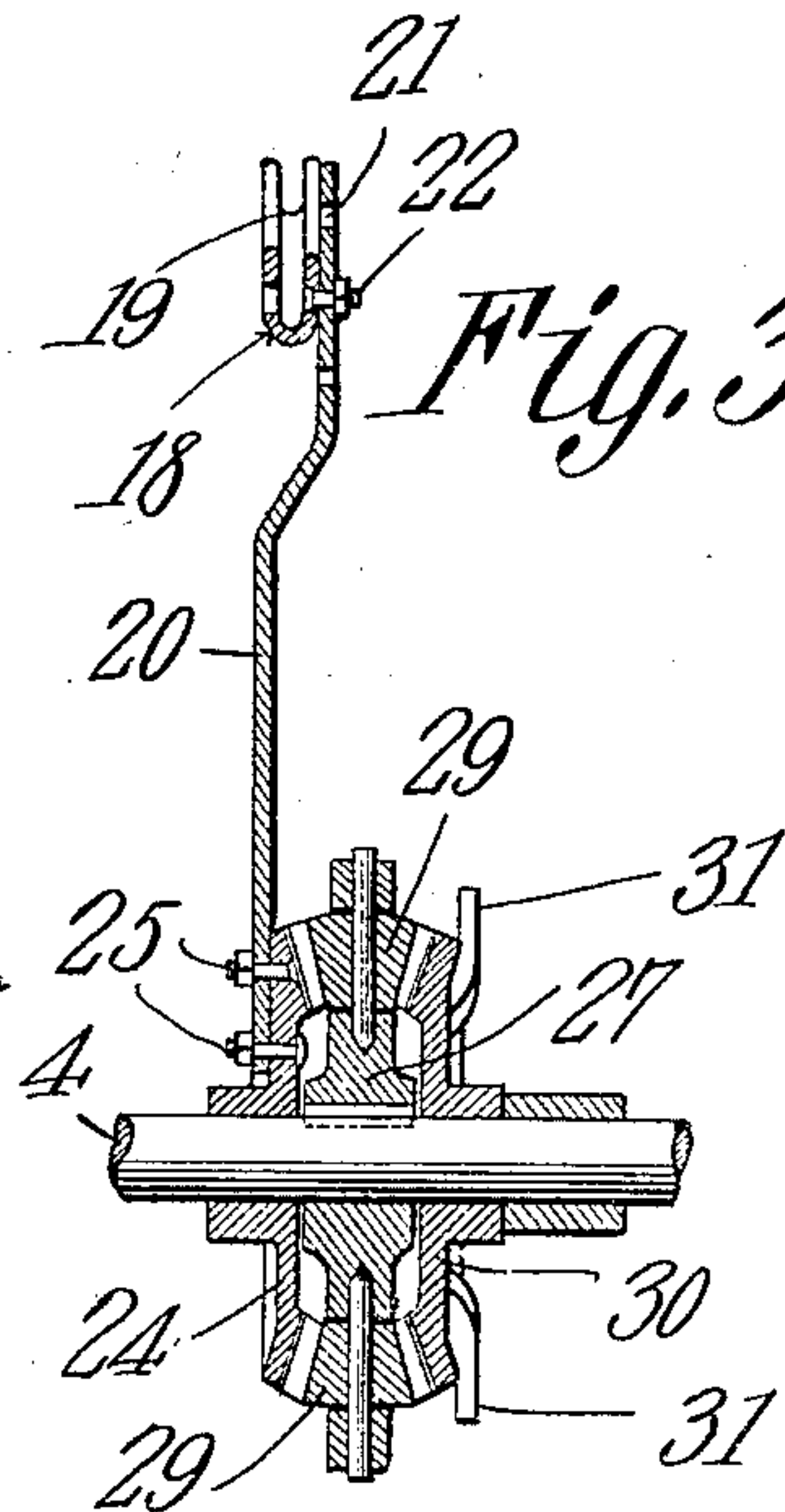


Fig. 3.



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UNITED STATES PATENT OFFICE.

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LOADING APPARATUS.

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To all whom it may concern:

Be it known that I, JAMES McCABE, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented a new and useful Loading Apparatus, of which the following is a specification.

This invention relates to loading apparatus of that type employing a forwardly extending gathering fork that is pivotally mounted on a vehicle so as to be actuated by means of a forward movement of the latter through mechanism arranged between the fork and one of the wheels of the vehicle, and more particularly to apparatus of that class in which the fork is adapted to deposit the load into a suitable box or receptacle carried by the vehicle at the rear of the fork.

The invention has for one of its objects to provide an apparatus for loading shocks of hay, grain, fodder, or other material into the body of the vehicle in a simple and effective manner.

A further object of the invention is the provision of a pivotally mounted gathering fork which is actuated by means of a flexible element arranged to simultaneously wind at one end and unwind at the other end on oscillatory quadrant or sheave segments, one of such quadrant or sheave segments being actuated from one of the axles of the vehicle through gearing that is adapted to be clutched by the attendant.

A further object of the invention is to provide means for automatically unclutching the driving connections when the fork has reached the dumping position.

A still further object of the invention is the employment of a buffer arranged on the front end of the vehicle box or body in the path of the fork so as to position the latter at the end of its lifting stroke.

A still further object is to improve and simplify the construction and operation of apparatus of the character referred to so as to be comparatively simple and inexpensive to manufacture and keep in repair, thoroughly reliable and efficient in use, and convenient to manipulate.

With these and other objects in view, as will more fully hereinafter appear, the invention consists in certain novel features of construction and arrangement of parts, hereinafter fully described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being

understood that various changes in the form, proportions, size and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings:—Figure 1 is a side elevation of a loading apparatus constructed and arranged in accordance with the invention. Fig. 2 is an enlarged detail view of the winding member. Fig. 3 is a vertical section on the line 3—3 of Fig. 2. Fig. 4 is a detail view illustrating the means for automatically unclutching the fork actuating means.

Similar numerals of reference are employed to indicate corresponding parts throughout the several figures of the drawings.

Referring to the drawing, A designates the running gears of a four wheeled vehicle on which is pivotally mounted a tilting box or body B, and hingedly supported on the running gears at a point in front of the box is a gathering fork C. The running gear comprises front and rear supporting wheels 1 and 2 on which the frame 3 is carried. The tilting box is of that type having its axis of tilting slightly to the rear of its middle so that the forward portion of the box will rest normally on the frame 3 while the rear portion overhangs the latter, the axis of tilting being the axle 4 for the rear wheels. The fork C comprises a plurality of parallel tines 5 suitably connected together and pivoted at their rear ends on the shaft 6, the said shaft being journaled in bearings 7, (of which one is shown in the present illustration), and located slightly in advance of the front end of the box 3. Carried on the front of the box is a buffer D comprising a frame 8 pivoted at its bottom to the box B at the point 9. This frame is yieldably held in a forwardly inclined position by means of the extension spring 10 located under the box with its rear end 11 anchored thereto and its front end connected to the frame 8. The buffer D is thus located in the path of the fork C as it moves on its lifting stroke, thereby cushioning the latter and bringing it gradually to rest without striking forcibly against the box B.

The mechanism for actuating the fork C is constructed as follows:—Adjacent the front of the frame 3 of the vehicle is a sheave segment or quadrant 12 fulcrumed at 13 on the frame 3 at a point slightly in front of the box B. This sheave segment or quadrant is composed of a curved member 14 of V-shaped

cross section and radial arms 15 to which the said member is connected. One of the arms is disposed normally in a horizontal position and is provided with an extension 16 that is flexibly connected by links 17 to the fork C adjacent the middle. Coöperating with the sheave segment or quadrant 12 is a second sheave segment or quadrant designated generally by 18 and more clearly shown in Figs. 2 and 3. This sheave segment or quadrant is composed of a curved metal strip 19 of V-shaped cross section and connected to the outer end of the right angularly disposed arm 20. The said arms and grooved member 19 are provided with a plurality of apertures 21, whereby the parts can be adjustably connected in different positions by bolts 22 passing through registering apertures. The inner ends of the arms 20 are held in sockets 23 formed on a disk or wheel 24, rivets or other fastenings 25 being employed to hold the parts together. Associated with these sheave segments or quadrants 12 and 18 is a flexible element 26, such as a wire cable, that has both ends fixed to the bottom portions of the members 14 and 19 of the sheave segments or quadrants, the arrangement being such that the cable will wind up in the groove of one of said members while unwinding from the groove of the other member. Of this motion transmitting mechanism the sheave segment or quadrant 18 is the driver, and the same is adapted to produce a draft on the cable 26 so that the sheave segment or quadrant 12 is rocked and the fork C raised to its unloading position. The unloading position of the fork is such that the latter will return to its initial position by its own weight, when the power is released from the actuating sheave segment or quadrant 18. The sheave segment or quadrant 18 is mounted on the main axle 4 and is adapted to be clutched thereto when the operator desires to raise the fork. The clutching of the quadrant of sheave segment with the axle is accomplished by means of a gear constructed on the compensating type and comprising a wheel 27 keyed to the rear axle 4 and carrying a plurality of pinions 29 that mesh with the teeth of the wheels 24 and 30, which latter are loosely mounted on the axle. To cause the sheave segment or quadrant 18 to be actuated it is merely necessary to arrest the movement of the wheel 30. This causes the pinions 29 to be actuated, the wheel 24 forming part of the cam structure 18. To arrest the movement of the wheel 30, the latter is provided with one or more radially extending projections 31, and mounted on the frame 3 adjacent the wheel is a lever or stop 32 fulcrumed at 33 and carrying a roller 34 that is adapted to engage the periphery of the wheel 30 and abut any one of the projections 31. This stop device 32 is connected by a rod 35 to an operating lever 36 fulcrumed adjacent

to the front of the frame 3. The operating lever 36 is connected to a lever 37 which is arranged in the path of movement of a lug 38 that is carried by the fork, the lug being so arranged that as the fork nears the limit of its upward movement, said lug will engage the lever 37 and will move the lever 36 to effect the withdrawal of the stop device from engagement with the wheel 30, thereby automatically disconnecting the fork actuating mechanism, so that the fork is free to return to the load receiving position by gravity.

From the foregoing description, taken in connection with the accompanying drawing, the advantages of the construction and of the method of operation will be readily apparent to those skilled in the art to which the invention appertains. In operation, the vehicle is driven forwardly by horses, or any other suitable means, the draft device for attaching the horses to the vehicle being eliminated in the present instance, since the same does not enter into the present invention. Assuming that the fork C has received its load, and the attendant has thrown the lever 36 forwardly, the fork is raised in the following manner. The stop 32 is moved from its dotted line position, Fig. 2, to its full line position through the movement of the operating lever 36. The wheel 30, which normally rotates with the axle 4 by meshing with the pinions 29, is immediately brought to rest so that the wheel 24 of the sheave segment or quadrant 18, which has in the meantime been idle, is actuated by the pinions 29 which revolve with the wheel 28. The sheave segment or quadrant 18 is thus turned so as to cause the cable 26 to wind thereon and unwind from the sheave segment or quadrant 12. Since the said sheave segment or quadrant is connected with the fork C, the latter is raised so as to deposit its load into the box B. Near the end of the unloading stroke, the fork strikes against the buffer D so as to permit the stroke to end gradually. Near the end of the unloading stroke the lug 38 of the fork will strike the lever 37 and the lever 38 will be moved in such manner as to withdraw the stop device 32 from engagement with the wheel 30, so that the fork can be turned to its lowermost load receiving position. As the fork swings down, the cable 26 winds up on the sheave segment or quadrant 12 and unwinds from the sheave segment or quadrant 18, and as the lever 36 is moved to release position, the wheel 30 is free to turn during the return stroke of the sheave segment or quadrant 18.

While the connections have been described in the nature of sheave segments connected by a flexible cable, it is to be understood that gears may be substituted for these connections without departing from the invention.

One or both of the segment or sheave sections is provided with a winding surface dis-

posed eccentrically to its center of rotation, so that as the cable is wound, the fork will be raised with an accelerated movement and maximum power is rendered available for
5 overcoming the inertia of and imparting initial movement to the fork and its load.

I claim:—

1. In an apparatus of the class described, the combination with a vehicle, a receptacle
10 mounted thereon, a loading fork carried by the vehicle, a loading fork actuating mechanism, manually operable means for clutching the same to a revoluble part of the vehicle, and means for automatically unclutching
15 said fork and permitting it to fall when the fork has moved to discharge position and an element upon the fork to actuate the unclutching means.

2. In apparatus of the class described, a
20 vehicle, a pivotally mounted fork carried thereby, a fork actuating means including a manually operable clutch, and mechanism for automatically disconnecting said clutch and permitting said fork to fall when the
25 movement of the fork is arrested at loading position and an element upon the fork to actuate the disconnecting mechanism.

3. In a device of the kind described, the combination with a truck having traction
30 wheels and a box or receptacle, of a fork pivoted to the truck frame in front of said box, a pair of sheave segments connected to said fork, a pair of sheave segments loose with respect to the traction wheels of said truck,
35 means for connecting said latter sheave segments to said traction wheels, at will, and means for disconnecting them at the proper times, and cables connecting the correspond-

ing sheave segments and arranged to raise said fork with an accelerated movement and
40 with a maximum initial power.

4. In a device of the kind described, the combination with a truck having rear traction wheels, front steering wheels and a box,
45 of a fork pivoted to said truck frame in front of said box, lifting levers pivoted to said truck frame and connected to said fork, sheave segments carried by said lifting levers, wheel driven sheave segments adjacent to said traction wheels, cables connecting
50 the corresponding front and rear sheave segments, means for coupling said rear segments to the traction wheels, at will, and means operating automatically to release said sheave segments from said wheels, at
55 the completion of the upward movement of said fork.

5. In a device of the kind described, the combination with a truck having rear traction wheels, a front steering wheel, of a piv-
60 otally mounted fork, power transmitting devices for connecting the rear axle to the fork, a lever, a clutching means operable by said lever and controlling the connection between the rear axle and the power transmitting
65 mechanism, and means on the fork for moving said lever to release position when the fork nears the limit of its unloading movement arranged to permit the fork to fall.

In testimony that I claim the foregoing as
70 my own, I have hereto affixed my signature in the presence of two witnesses.

JAMES McCABE.

Witnesses:

JNO. E. PARKER,
J. ROSS COLHOUN.