M. H. HUBBACK.

HYDRAULICALLY OPERATED LOADING DEVICE.

APPLICATION FILED FEB. 25, 1919.

1,356,149. Patented Oct. 19, 1920.

2 SHEETS—SHEET 1.

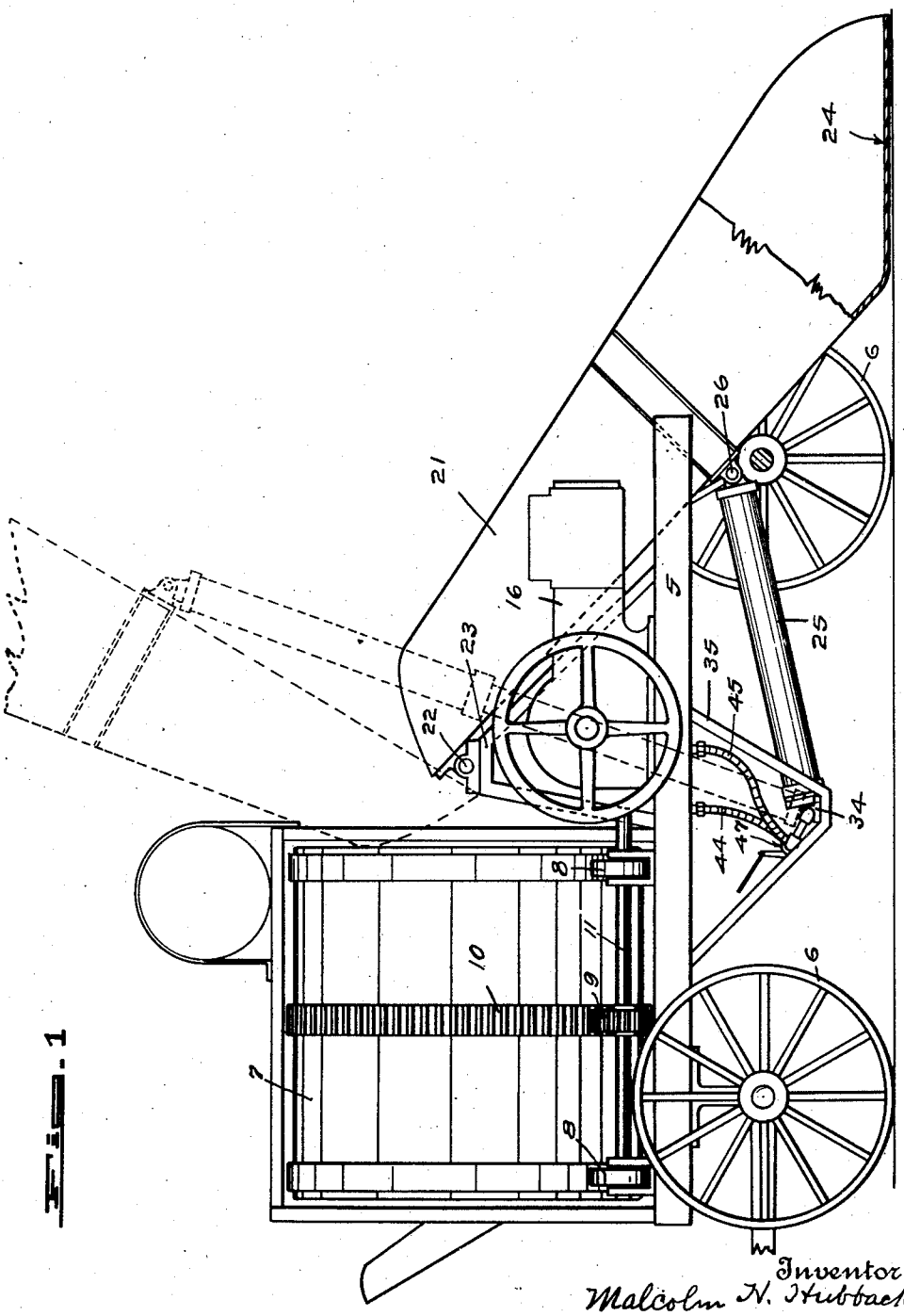


Fig. 1

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2 SHEETS—SHEET 2.

Fig. 2

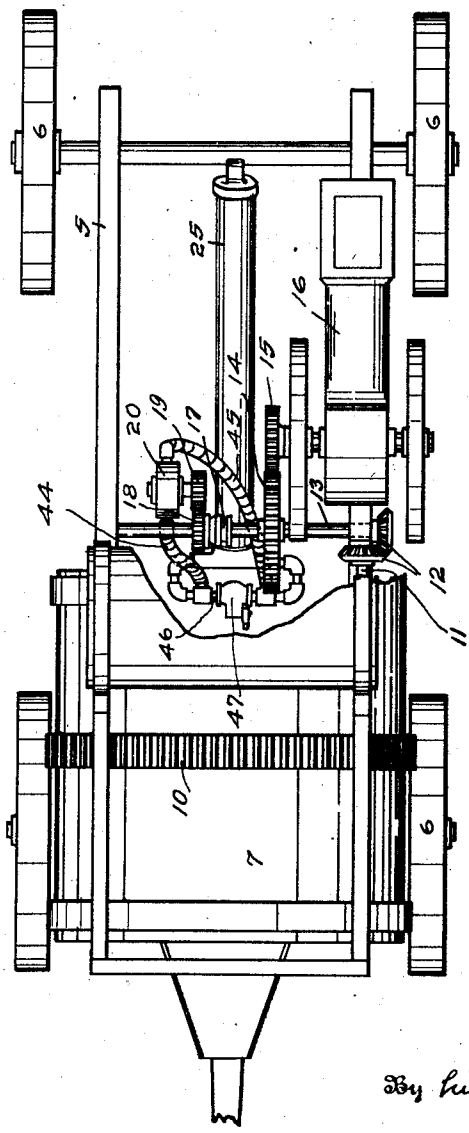
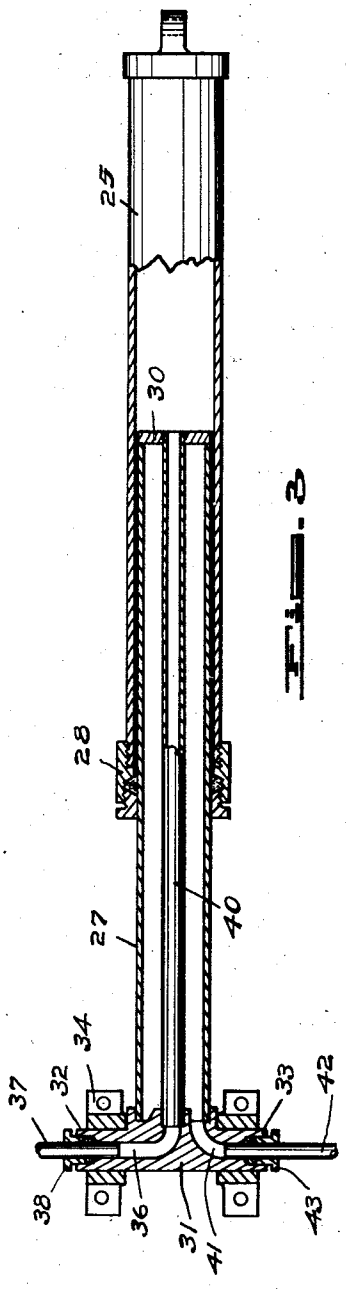


Fig. 3



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UNITED STATES PATENT OFFICE.

MALCOLM H. HUBBACK, OF SEATTLE, WASHINGTON.

HYDRAULICALLY-OPERATED LOADING DEVICE.

1,356,149. Specification of Letters Patent. Patented Oct. 19, 1920.

Application filed February 25, 1919. Serial No. 279,199.

To all whom it may concern:

Be it known that I, MALCOLM H. HUBBACK, a citizen of the United States, residing at Seattle, in the county of King and State of Washington, have invented a certain new and useful Improvement in Hydraulically-Operated Loading Devices, of which the following is a specification.

My invention relates to improvements in hydraulically operated loading devices and the object of my invention is to provide a machine of strong and durable construction that is adapted for lifting various materials and discharging the same into a receptacle located at a higher elevation.

A further object is to provide a loading device having a hydraulic jack that is located below the loading device and is connected directly therewith whereby all cables and overhead supports ordinarily used in loading devices may be dispensed with.

My invention is herein illustrated and described as installed on a concrete mixer for the purpose of delivering dry material into the mixing drum thereof but it will be understood that it may be advantageously adapted to many other uses.

I accomplish these objects by devices illustrated in the accompanying drawings, wherein—

Figure 1 is a view in side elevation, with one rear wheel removed, of a concrete mixer whereon is installed a loading device constructed in accordance with my invention, certain positions that the loading device may assume being illustrated by broken lines;

Fig. 2 is a plan view of the device shown in Fig. 1 with the loading hopper removed and certain parts broken away to reveal the construction of other parts; and

Fig. 3 is a view partly in longitudinal mid-section and partly in elevation of a hydraulic jack constructed in accordance with my invention.

Referring to the drawings, throughout which like reference numerals indicate like parts, the numeral 5 designates a portable frame that is mounted upon wheels 6 and is provided on its forward end with a concrete mixing drum 7 supported on rollers 8 and adapted to be rotated by a pinion 9 that meshes with a gear rack 10 on the drum 7.

The pinion 9 is secured on a shaft 11 that is connected by bevel gears 12 with a transverse shaft 13 that is connected by a gear wheel 14 and pinion 15 with an engine 16, the engine being carried on the frame 5.

The driven shaft 13 is connected by means of a clutch 17 and gear wheels 18 and 19 with a rotary pump 20 which is preferably a geared pump of high pressure type.

The loading device proper comprises a relatively long hopper or chute 21 the upper end of which is connected by a pivot 22 with rigid upright supports 23 that are carried on the frame 5, and the lower end of which is formed at an angle to the body of the hopper as indicated at 24 in such a manner as to adapt it to rest squarely upon the ground or other surface upon which the wheels 6 are supported so that material, as sand and gravel, may be dumped into the lower end of the chute 21 and will be discharged from the upper end of the chute 21 into the mixing drum 7 when such chute 21 is elevated.

The means for lifting the outer end of the loading chute 21 consists of a hydraulic jack, as shown in Fig. 3, which comprises an outer hollow cylindrical member 25 that is connected by a pivot 26 with the bottom side of the loading chute 21 and is adapted to have an inner hollow cylindrical member 27 reciprocally disposed therein, a gland 28 being provided at the end of the outer cylindrical member 25 to prevent leakage of fluid between the walls of said two cylindrical members.

The end of the inner cylindrical member 27 that is disposed within the outer cylindrical member 25 is closed by an end wall 30 while the opposite end of the inner cylindrical member 27 is rigidly secured to a head block 31 which head block is formed with oppositely projecting drums 32 and 33 that are arranged to be journaled in bearings 34 that are supported by fixed brackets which extend downwardly from the frame 5.

The drum 32 is provided with an axial bore 36 within which projects a pipe 37, which passes through a stuffing box 38 to prevent a leakage around the exterior of the pipe and at the same time permit the drum to be rotated while the pipe 37 remains stationary.

The passageway 36 is grooved at its inner end and is connected with one end of a tube 40 that is disposed axially within the inner cylindrical member 27 and communicates at its other end with the interior chamber of the outer cylindrical member 25 so that fluid

may be forced through the pipe 37, the passageway 36 and the tube 40 into the outer cylindrical member 25.

The drum 33 is provided with an axial bore 41 within which projects a pipe, the pipe 42 being provided with a stuffing box 43. The passageway 41 is connected with the interior of the inner cylindrical member 27.

The pipe 37 is connected by suitable fittings, as more clearly shown in Fig. 2, with a discharge conduit 44 that is connected with the pump 20, and the pipe 42 is connected in a similar manner by a conduit 45 with the suction side of the pump 20.

The pipes 37 and 42 are also connected with each other by a pipe 46 wherein is provided a valve 47, the pipe 46 and valve 47 constituting a valve-controlled passageway.

The valve 47 may be of any suitable form adapted to work under high pressure and is preferably provided with suitable means whereby it may quickly and easily be opened and closed.

In operation when the loading chute 21 is in the lowered position, as shown in Fig. 2, the two cylindrical members 25 and 27 of the hydraulic jack will be telescoped and the internal cavity of the member 27 will be filled with oil or other suitable fluid for operating the jack. After a load of material has been placed in the outer end of the loading chute 21 such chute may be lifted into a position substantially as shown by broken lines in Fig. 1 by engaging the clutch 17 and starting the pump 20 thereby causing fluid to be drawn from the interior of the cylindrical member 27 to the pump 20 and thence to be forced under a high pressure through the conduit 44, pipe 37, passageway 36, and pipe 40 into the cylindrical member 25.

Thus in moving said cylindrical member 25 outwardly into the position shown by broken lines and lifting the outer end of the loading chute into such position, the load which has been placed in the outer end thereof will be discharged by gravity into the mixing drum.

After the load has been discharged the valve 47 may be opened thereby permitting the fluid within the cylindrical member 25 to flow through the tube 40, passageway 36, pipe 37, passageway 47 and pipe 42 into the cylindrical member 27, the weight of the loading chute serving to effect the return flow of the fluid and the area of opening of the valve 47 determining the rapidity of descent of the loading chute 21. While my loading device has been described as installed upon a concrete mixer it will be readily understood that any form of receptacle other than the mixing drum 7 may serve to catch the material that is discharged from the loading chute 21 and that many materials other than sand and gravel may be advantageously handled by a loading device of this form.

Obviously changes may be made in the precise form of construction and arrangement of various parts of my invention without departing from the spirit thereof.

What I claim is:

1. A loading device comprising a portable frame, a support extending upwardly from said frame, a receptacle on said frame, a loading hopper pivoted at the inner end to said support and arranged to discharge by gravity into said receptacle when the outer end thereof is elevated, the outer end of said loading hopper being below the inner end thereof when said loading hopper is positioned for filling, brackets extending downwardly from said frame, a hydraulic jack pivoted at one end to said brackets and at the other end to the bottom of said loading hopper, a power driven pump on said frame and conduits leading from said pump to said hydraulic jack whereby fluid under pressure may be introduced into said hydraulic jack.

2. A concrete mixer comprising a portable frame, a mixing drum mounted for rotation on the forward end thereof, a loading hopper pivoted to said frame adjacent its inner end and adapted to discharge material into said drum when the outer end thereof is elevated, the outer end of said loading hopper being arranged to rest on the ground when said hopper is being filled, brackets extending downwardly from said frame, a hydraulic jack having one end pivoted to said brackets and the other end pivoted to the bottom of said frame, a pump, an engine supported on said frame and arranged to drive said pump and fluid conduits connecting said pump and said hydraulic jack.

In witness whereof, I hereunto subscribe my name this 20th day of February, A. D. 1919.

MALCOLM H. HUBBACK.