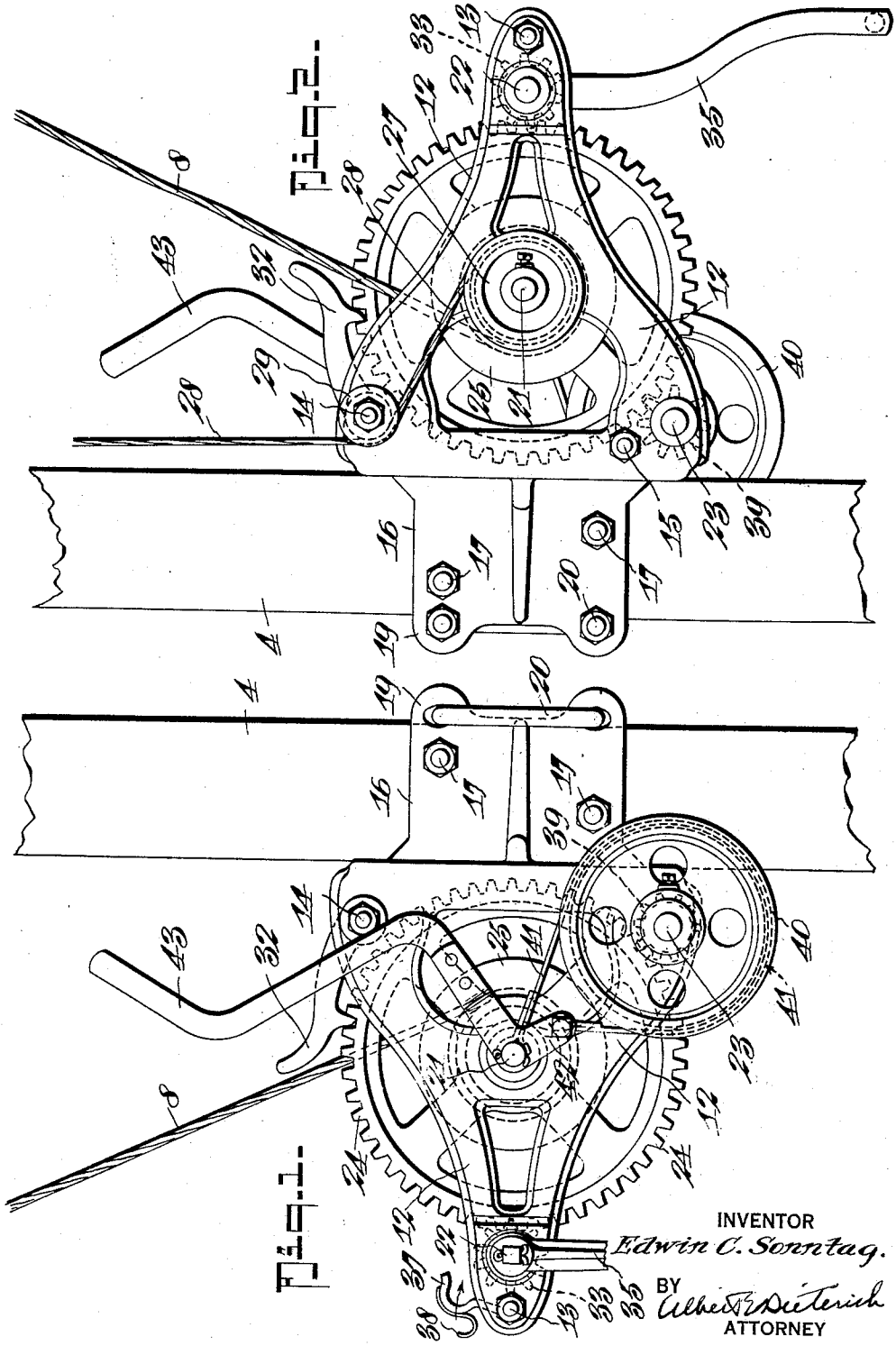
Feb. 11, 1930. E. C. SONNTAG 1,747,034

HOIST

Filed Dec. 29, 1928 2 Sheets-Sheet 1



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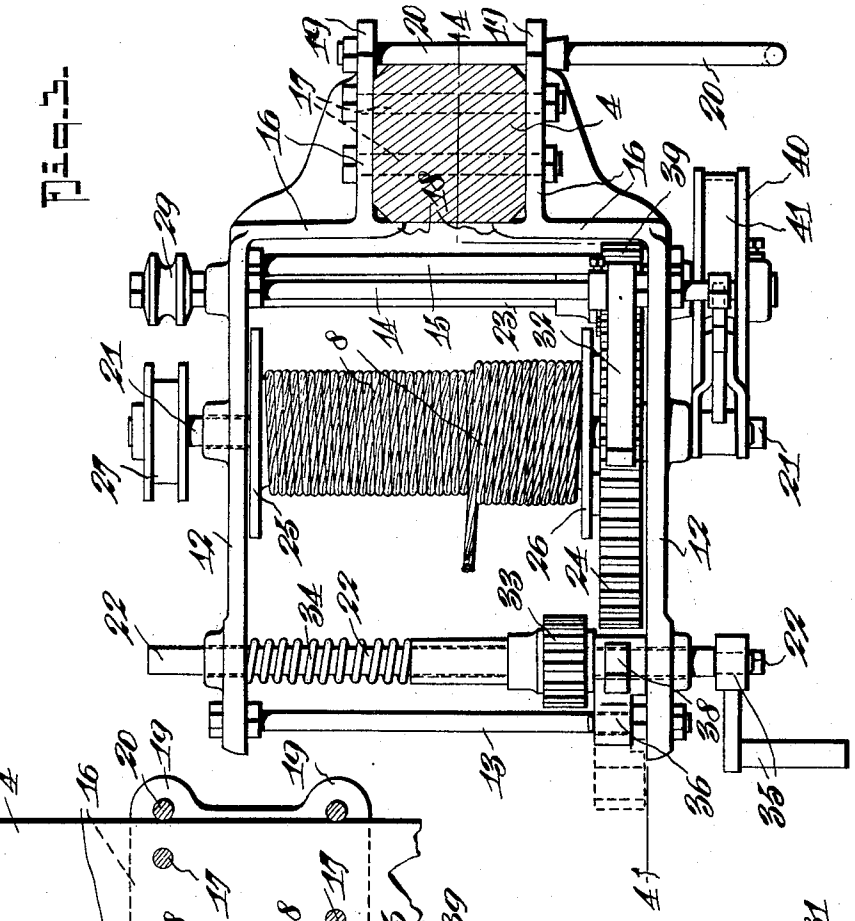


Fig. 1.

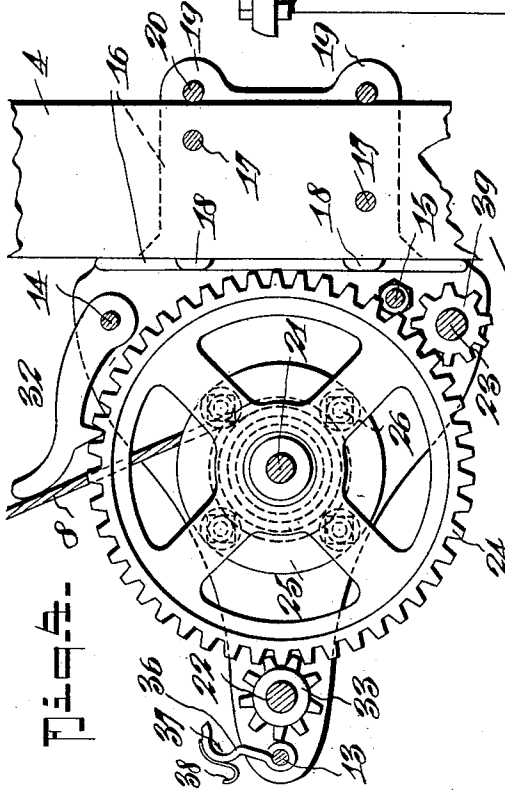


Fig. 4.

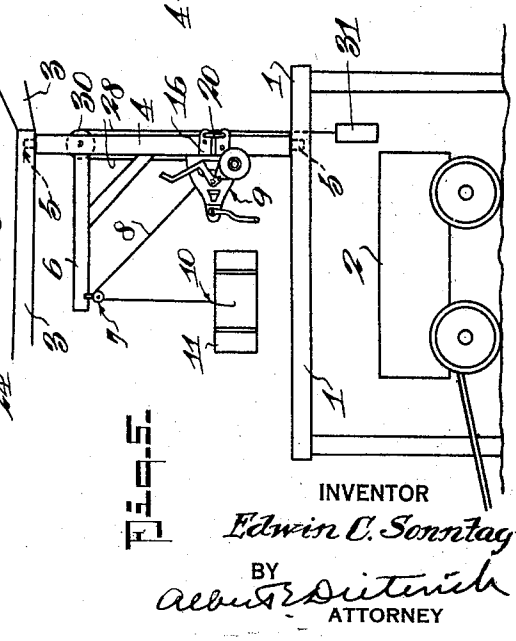


Fig. 5.

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UNITED STATES PATENT OFFICE

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HOIST

Application filed December 29, 1928. Serial No. 329,263.

The invention generally relates to hoists and primarily has for its object to provide a novel, economically constructed and efficiently operable hoist structure readily mountable as an attachment upon the swinging hoist column of a cotton baling and loading platform to facilitate the handling of the cotton bales and to better assure the safety of operators of the device.

Platforms of the kind referred to are elevated above the ground or floor to facilitate wagon loading and are commonly provided with a derrick arm equipped column swingable about a vertical axis to enable lifting of the load above the platform and swinging it out over the wagon. Mechanical hoists are employed to lift and lower the load but with the customary crank and gear equipments these hoists commonly cause injury to the operators, especially during the load lowering operation when the operating crank is caused to swing free in space, rapidly and dangerously. On the other hand, if the crank is employed to effect the lowering, it is a very slow and also dangerous operation.

Therefore, it is an object of the invention to provide an improved hoist in which the crank and pinion employed for actuating the winding drum are bodily shiftable out of operative position during the lowering operation means also being provided to control the rotation of the winding drum during the said lowering operation.

Another object of the invention is to provide counterbalance devices which act following each lowering operation to return the parts to the normal position and during each hoisting operation to minimize the force application necessary to be applied through the turning crank to effect the said hoisting.

Other objects will in part be obvious and in part be pointed out hereinafter.

To the attainment of the aforesaid objects and ends, the invention further resides in the novel details of construction, combination and arrangement of parts, all of which will be first fully described in the following detailed description, then be specifically pointed out in the appended claims, reference being had to the accompanying drawings, in which:—

Figure 1 is a side elevation of the invention.

Figure 2 is a reverse side elevation.

Figure 3 is a plan view, the turning crank being shown shifted to the non-operative position.

Figure 4 is a vertical cross section taken on the line 4—4 on Figure 3.

Figure 5 is an elevation showing the hoist in operation.

In the drawings, in which like numerals of reference indicate like parts in all of the figures, 1 designates a baling platform such as are commonly employed in connection with baling and loading of cotton. In Figure 5 of the drawings I have diagrammatically illustrated such a platform with the invention mounted thereon.

In the illustration referred to a wagon is generally indicated at 2. Between ceiling beams 3 and the platform 1 proper, a derrick column or standard 4 is mounted in end socket bearings 5 so as to be rotatable about a vertical axis. A derrick beam 6 is rigidly secured to the column and extends therefrom to facilitate lifting a load above the platform and swinging it out over and loading it onto a wagon. The beam 6 carries a pulley 7 over which the hoist cable 8 passes.

In the diagrammatic illustration in Figure 5 the hoist is generally designated 9 and it will be observed by reference to this figure, and the remaining figures of the drawings, that the hoist is so constructed as to be readily mountable as an attachment upon the column 4. One end of the cable is, of course, wound around a winding drum forming a part of the hoist and its free end which passes over the pulley 7 is equipped with suitable grapples

10 by which the bale 11 may be conveniently secured.

The hoist comprises uniformly constructed side plates 12 which are secured together in parallel spaced relation by spacer bolts 13, 14 and 15. Each of the plates is provided with a right angled extension and the extensions together form parallel spaced mounting ears which form a socket for and engage the sides of the columns 4 to which they are secured by bolts 17. Each of the extensions 16 includes inwardly extended abutment ears 18, and at their extreme ends, with extension ears 19 in which a U-shaped handle member 20 is secured. The handle member 20 extends a considerable distance to one side of the hoist and serves as a convenient means for facilitating the turning of the derrick column 4 and the hoist carried thereby about the axis of the said column during the operation of the hoist.

A drum shaft 21, a crank shaft 22 and a brake shaft 23 are rotatably mounted in suitable bearings provided therefor in the side plates 12 and the drum shaft 21 is equipped with a large gear 24 and a winding drum 25 which is secured as at 26 to the said gear to rotate therewith. The shaft 21 is also extended at one end and has fixed thereon a pulley 27 over which the counterbalance cable 28 is wound. The cable 28 passes under an idler pulley 29 mounted on an extension of the spacer bolt 14 and from thence over a pulley 30 mounted on the column 4, and to the free end of its cable a counterbalance weight 31 is attached, the purpose for which will later be described.

The lock dog 32 is also pivoted on the spacer bolt 14 in position for engaging the large gear 24 to lock the same against rotation whenever desired.

A shaft 22 is longitudinally shiftable in its side plate bearings and is provided with a pinion 33 adapted to mesh with the drum gear 24 during hoisting operations. A spring 34 is interposed between one side plate 12 and the pinion 33, and constantly tends to hold the pinion 33 in mesh with the gear 24. The shaft 22 has one end extended and squared to receive a turning crank 35 by which the shaft 22 may be rotated to impart rotation to the winding drum during hoisting operations.

A lock latch 36 is pivoted on the spacer bolt 13 and is equipped with a socket 37 to overlie the shaft 22 at times and a lift grip 38 by which the said latch may be conveniently gripped to change its position, the purpose for all of which will later be described.

The shaft 23 is also provided with a pinion 39 and is extended at one end and has a brake drum 40 with which cooperates a brake drum 41 having one end attached to the shaft 21 and the other end thereof secured to a crank extension of the brake lever 43 which is pivoted on the said shaft 21.

The invention operates as follows: When it is desired to hoist a bale of cotton above the platform and swing it over above and lower it onto a wagon, the grapple 10 is suitably secured to the bale and the crank 35 turned to impart rotation through the pinion and gear connections 33 and 24 to the drum 25. The cable 8 will thus be wound around the drum and the bale will be lifted above the platform. The tooth of the lock dog 32 is shaped to present a flat stop face at one side and a bevelled face at the other side so as to act as a back check pawl. The dog thus permits rotation of the drum in the cable winding direction but prevents rotation in the unwinding direction.

By now grasping the handle extension 20 the hoist and derrick column 4 on which it is mounted may be readily swung to position the load over the wagon 2. By shifting the crank shaft 22 longitudinally to cause the pinion 33 to move out of mesh with the gear 24 and by swinging the lock latch 36 into position in engagement with the shaft 22 the pinion and shaft 33 and 22 will be held to their shifted position against the tension of the spring 34 so that when the drum rotates during the lowering of the bale the crank will remain motionless and all possibility of injury to the operator, through the otherwise rotating crank, is avoided.

By proper manipulation of the brake lever 43 the lock dog 32 can be first disengaged and then the load allowed to lower as fast or as slowly as the operator may desire through the control made possible by the brake connections hereinbefore described and controlled by the lever 43.

During the hoisting operation or, in other words, during the active operation of the pinion 33 the counterbalance devices 28—31 aid the hoisting operation and while the said devices will not interfere with the proper lowering of the load, when the load has been lowered and detached the said devices will serve to reversely wind the drum and return the parts to the normal position.

From the foregoing description taken in connection with the accompanying drawings, it is thought the novel details of construction, the manner of use and the advantages of my invention will be readily apparent to those skilled in the art to which it relates.

What I claim is:

1. A hoist mountable as an attachment to a column and comprising spaced frame plates having right angled extensions cooperating to form a column engaging socket, means to secure the plates in rigid spaced relation, a turning shaft, a drum shaft, a brake shaft, all said shafts having rotative bearing in the frame plates, a pinion on the turning shaft, a pinion on the brake shaft, a winding

drum and gear on the drum shaft which gear meshes normally with the two pinions, said turning shaft being longitudinally shiftable to enable longitudinal movement thereof to disengage its pinion from the gear, a turning handle on the turning shaft, a lock pawl for the gear, means to hold the turning shaft shifted, means normally tending to hold the turning shaft at the pinion and gear meshing position, and brake means to variably retard rotation of the brake shaft for the purposes described.

2. In hoisting derricks wherein is provided a column; a hoist comprising a frame composed of side plates and spacer-tie-bolts securing said plates in spaced relation, said side plates having rearwardly extending projections constituting, in association, a socket to receive said column, means passing through said extensions and said column to secure said frame to said column, a drum shaft journalled in bearings in said frame side plates and carrying a hoisting drum and a pulley, crank and gear means to turn said drum shaft to wind a cable thereon, a counterbalancing cable on said pulley, a pulley on said column over which said counterbalancing cable passes, and a counterweight on said counterbalancing cable.

3. In hoisting derricks wherein is provided a column; a hoist comprising a frame composed of side plates and spacer-tie-bolts securing said plates in spaced relation, said side plates having rearwardly extending projections constituting, in association, a socket to receive said column, means passing through said extensions and said column to secure said frame to said column, a drum shaft journalled in bearings in said frame side plates and carrying a hoisting drum, a master gear on said drum shaft, a brake shaft, a pinion on said brake shaft meshing with said master gear, a brake lever journalled on said drum shaft, a brake drum on said brake shaft, a brake strap embracing said brake drum and having an end connected to said lever and another end journalled on said drum shaft, and a crank shaft journalled in said frame and having a shiftable pinion to mesh with said master gear normally, and means to hold said shiftable pinion out of mesh while the drum is unwinding and the brake is being applied.

4. In hoisting apparatus wherein is provided a hoist mounted on a vertical column; a hoist comprising a frame composed of right and left side plates having rear projections comprising means to engage the column, bolts passing through said projections and said column to mount said side plates on said column, spacer-tie-bolts connecting said side plates and therewith constituting a rigid frame, a hoisting drum with drum shaft mounted in said frame in bearings in said side plates, a master gear on said drum shaft a back check pawl on one of said spacer-tie-bolts and engageable with said master gear, a crank shaft journalled in bearings in said side plates, a pinion slidably keyed on said crank shaft to mesh with said master gear, means continuously tending to mesh said pinion with said gear, and a hold-out latch pivoted to another one of said spacer-tie-bolts and having a portion adapted to overlie a part of said crank shafts thereby to hold said pinion out of mesh with said gear at times.

EDWIN C. SONNTAG.