

H. W. BACHELDER.
HOISTING APPARATUS.
APPLICATION FILED JUNE 16, 1908.

939,955.

Patented Nov. 9, 1909.
3 SHEETS—SHEET 1.

Fig. 1.

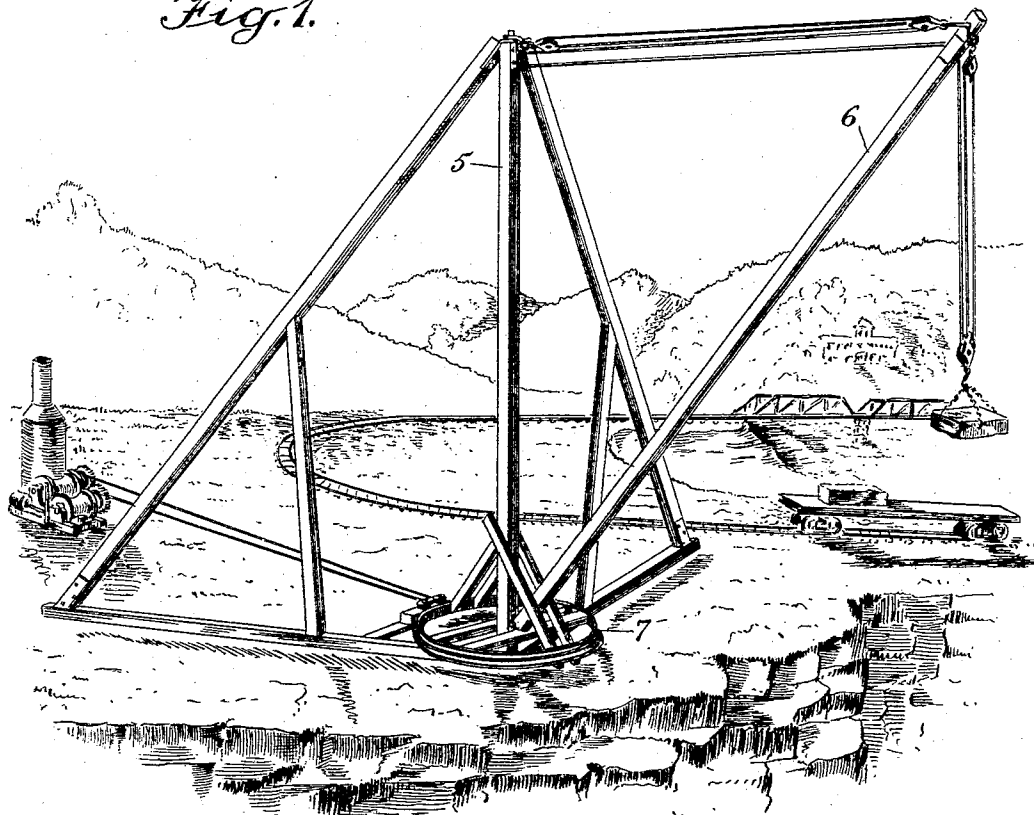
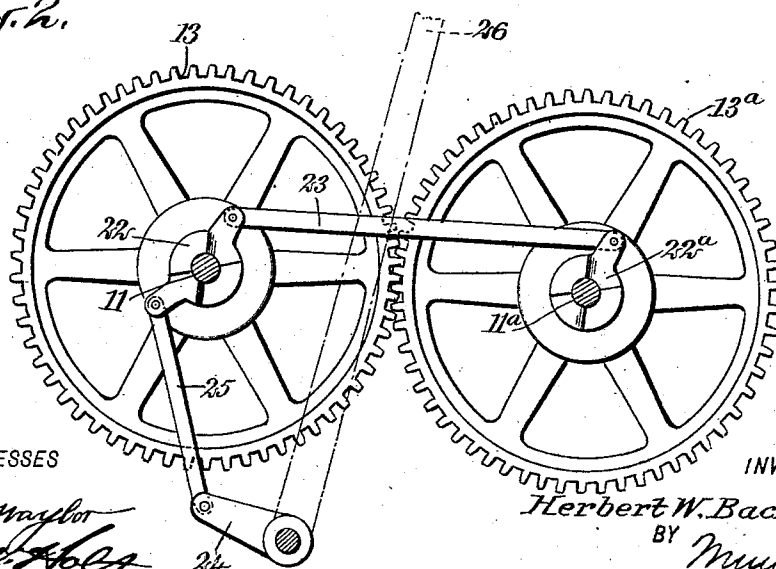


Fig. 2.



WITNESSES

Geo. W. Maylor
Wm. A. Allen

INVENTOR

Herbert W. Bachelder
BY *Munn & Co.*
ATTORNEYS

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3 SHEETS—SHEET 2.

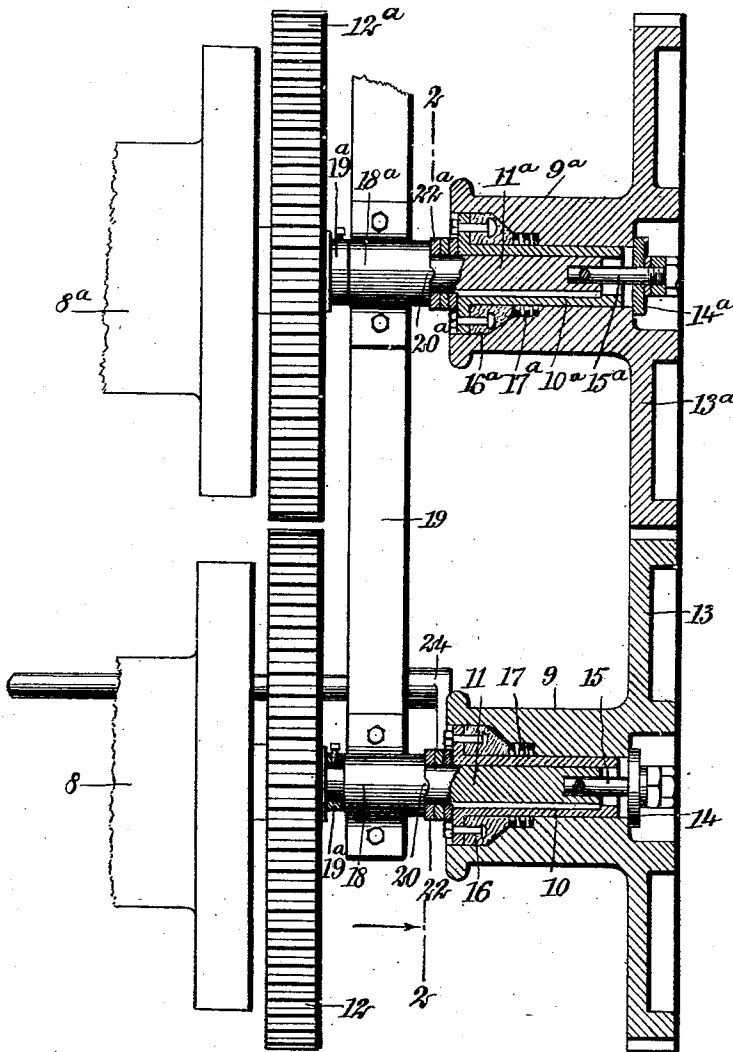


Fig. 3.

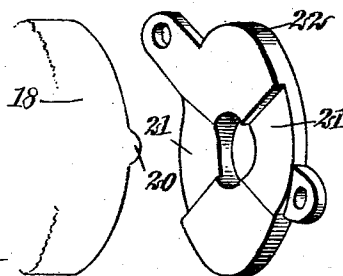


Fig. 4.

WITNESSES

Geo. W. Maylor
W. C. Holt

INVENTOR

Herbert W. Bachelder

BY *Mumford*

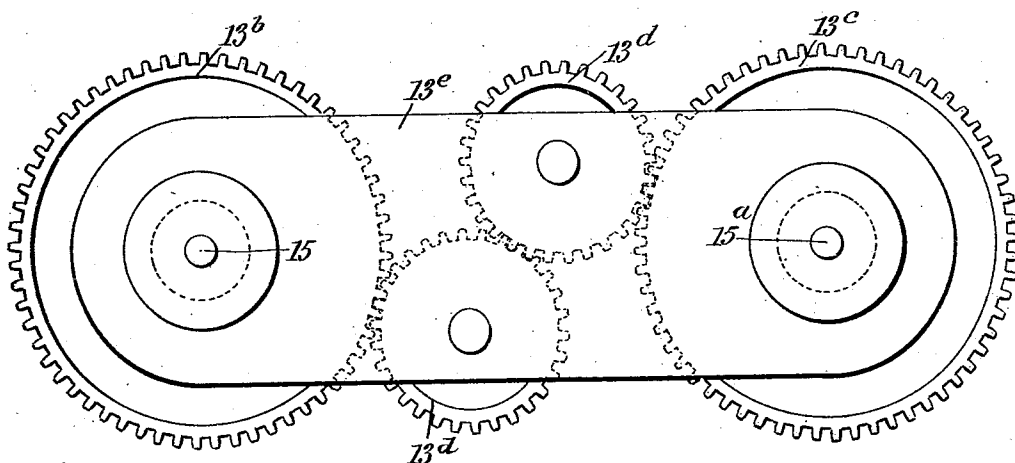
ATTORNEYS

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3 SHEETS—SHEET 3.

Fig. 5.



WITNESSES

Geo. W. Taylor
James H. Lee

INVENTOR

Herbert W. Bachelder

BY *Munn & Co.*

ATTORNEYS

UNITED STATES PATENT OFFICE.

HERBERT WALTER BACHELDER, OF SCHENECTADY, NEW YORK.

HOISTING APPARATUS.

939,955.

Specification of Letters Patent.

Patented Nov. 9, 1909.

Application filed June 16, 1908. Serial No. 438,756.

To all whom it may concern:

Be it known that I, HERBERT W. BACHELDER, a citizen of the United States, and a resident of Schenectady, in the county of Schenectady and State of New York, have invented a new and Improved Hoisting Apparatus, of which the following is a full, clear, and exact description.

This invention is an improvement in hoisting appliances, and has in view means for swinging the boom, comprising two drums driven one from another to rotate in opposite directions, actuating means for the drums, and means for simultaneously connecting the actuating means with one of said drums and disconnecting the actuating means from the other drum.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a perspective view of a hoisting apparatus embodying my invention; Fig. 2 is a sectional view on an enlarged scale, on the line 2—2 of Fig. 3, illustrating a portion of the prime feature of the invention; Fig. 3 is a fragmentary view illustrating the preferred embodiment of my improvements partly in central longitudinal section; Fig. 4 is a perspective of a detail of construction on an enlarged scale; and Fig. 5 is an elevational view, illustrating a modified construction of the invention.

I have shown my invention applied to an ordinary form of derrick, which essentially consists of a mast 5, carrying a boom 6, and provided with a driving pulley 7 at its base, the load carried by the boom being elevated and lowered by the block and tackle actuated from drums 8 and 8^a of the hoisting engine. The ends of the cable passing about the pulley 7 pass respectively to drums 9 and 9^a, forming features of my invention. These drums are respectively journaled on thimbles 10 and 10^a, which are slidably splined to shafts 11 and 11^a, rigid with the gears 12 and 12^a, the latter being the main gears of an ordinary standard two-drum hoist and each intermeshing directly with the driving pinion on the crank shaft of the engine, and hence both gears always turn in the same direction.

The drums 9 and 9^a are integral or otherwise rigid with intermeshing gears 13 and 13^a, preferably located at their outer sides. The hubs of these gears are preferably coun-

terbored, providing shoulders against which collars or washers 14 and 14^a respectively seat and receive studs 15 and 15^a, projecting from and rigid with the outer ends respectively of the shafts 11 and 11^a. On the outer ends of the studs 15, 15^a, lock-nuts are threaded and prevent the withdrawal of the drums 9 and 9^a from the shafts. The inner ends of the drums 9 and 9^a are counterbored for receiving conical friction-clutches 16 and 16^a, which are bolted or otherwise secured to the inner flanged ends of the thimbles 10 and 10^a. These friction clutches are normally forced from engagement with the drums by springs 17 and 17^a incased in the annular recesses surrounding the thimbles 10 and 10^a.

The shafts 11 and 11^a are journaled in bearings 18 and 18^a carried by the side frame 19, said bearings having ribs or projections 20 and 20^a on their end faces, adjacent to the drums 9 and 9^a. The ribs of the bearings are adapted to register with and bear on inclined or cam portions 21 of collars 22 and 22^a, which respectively surround the shafts 11 and 11^a, adjacent to but separated from the friction clutches by suitable washers, as clearly illustrated in Fig. 3.

The collars 22 and 22^a are compelled to move in unison by a connecting link 23, as best shown in Fig. 2, and the inclined or cam faces of these collars are reversely arranged, whereby as they are revolved in one direction, one of the friction clutches will be forced into engagement with its respective drum, and the other friction clutch will be released, permitting it to be withdrawn under the influence of its spring. In order that the collars 22 and 22^a may be conveniently actuated, one of them is connected to a crank-arm 24 through the intermediary of a link 25, said crank-arm being rigid with a controlling lever 26, shown in dotted outline in Fig. 2.

On each shaft 11, just at the inside of the frame 19, is preferably provided a collar 19^a, removably held by a set-screw, which operates to take the thrust exerted by the cam face collars when forcing the friction clutches into engagement with the drums, and so prevent any tendency to spring the bearing or cause end thrust on the shafts.

From the construction shown and described, it will be seen that on throwing the lever 26 in one direction, either of the drums 9 or 9^a, according to the disposition of the inclined or cam faces 21 on the collars 22,

will throw one of the clutches into engagement and release the other, which will wind the cable on the driven drum and pay out the cable on the other drum at the same rate. If the lever be moved to its extreme position in the opposite direction, the reverse operation will take place, or, if the lever be shifted to an intermediate position, both friction clutches will remain in a withdrawn position, and the drums will, as a consequence, be idle when the shafts 11 and 11^a revolve. This construction it is apparent permits of the swinging of the derrick at the same time the load or boom is being elevated or lowered, or while the boom is stationary, as desired.

In the modified construction shown in Fig. 5, the gears 13^b and 13^c, corresponding to the gears 13 and 13^a, respectively, instead of being directly geared together are intergeared through the intermediary of two intermeshing pinions 13^d, the latter being carried on a heavy plate 13^e, by which the hubs of the gears 13^b and 13^c are also connected, this connection being effected by extending the pins 15, 15^a through the plate. This plate helps to make the entire apparatus extremely rigid and resists any tendency to bend either shaft by an excessive pull on the line, since it transfers part of the strain directly to the other shaft. If it is desired to tighten the line running around the pulley or bullwheel 7, it is only necessary to remove one of the idle pinions 13^d and then hold one drum from turning while the line is wound up on the other until the desired tension is secured, and then replace the idle gear. In either this construction or that shown in Figs. 1, 2 and 3, it is evident that the relative position of the drums is always constant and that they always rotate in opposite directions. It follows from this, that any constant tension desired can be had on the line or cable, and it is impossible for it to become slack at any time. For example, the boom and its load may be placed in motion by throwing the operating lever to one of its extreme positions, and then by throwing the lever in its neutral position allow the momentum of the boom to carry it around. As the line is pulled off from one drum it winds up at an equal speed on the other.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. The combination of drums, a shaft ex-

tended from each drum, drums journaled on the shafts and geared together to revolve in opposite directions, and means for alternately connecting and disconnecting the last mentioned drums with their respective shafts.

2. The combination of a mast, a bullwheel fixed to the mast, two drums geared together, to revolve in opposite directions and arranged in the same transverse plane, a cable passing about the bullwheel having its ends respectively connected to the drums, means for actuating the drums, and means for connecting one of the drums with the actuating means and releasing the other drum therefrom.

3. In a hoisting apparatus, a boom, means for swinging the boom, including two drums arranged on separate and independent shafts and driven one from another to rotate in opposite directions, friction clutches for throwing the drums into and out of operation, and means for simultaneously moving one of said clutches into engagement with its drum and releasing the other clutch from the opposite drum.

4. The combination of two drums geared together to rotate in opposite directions, with the longitudinal axis of one of the drums arranged in advance of the longitudinal axis of the other drum, means for driving the drums, including friction clutches, collars having cam faces for throwing said clutches into engagement with the drums and releasing them therefrom, and means for simultaneously actuating said collars to engage one of said clutches and release the other.

5. The combination of two drums geared together, thimbles on which the drums are journaled, a friction-wheel rigid with each thimble and inclosed within the hubs of the drums, means normally tending to force the friction-wheels from the drums, shafts geared together on which the thimbles are slidably splined, and means for simultaneously forcing one of said thimbles and its friction-wheel against the tension of said means, to engage the friction wheel with its drum and release the other friction wheel.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HERBERT WALTER BACHELDER.

Witnesses:

CHAS. E. LONG,
LEON K. PAXSON.