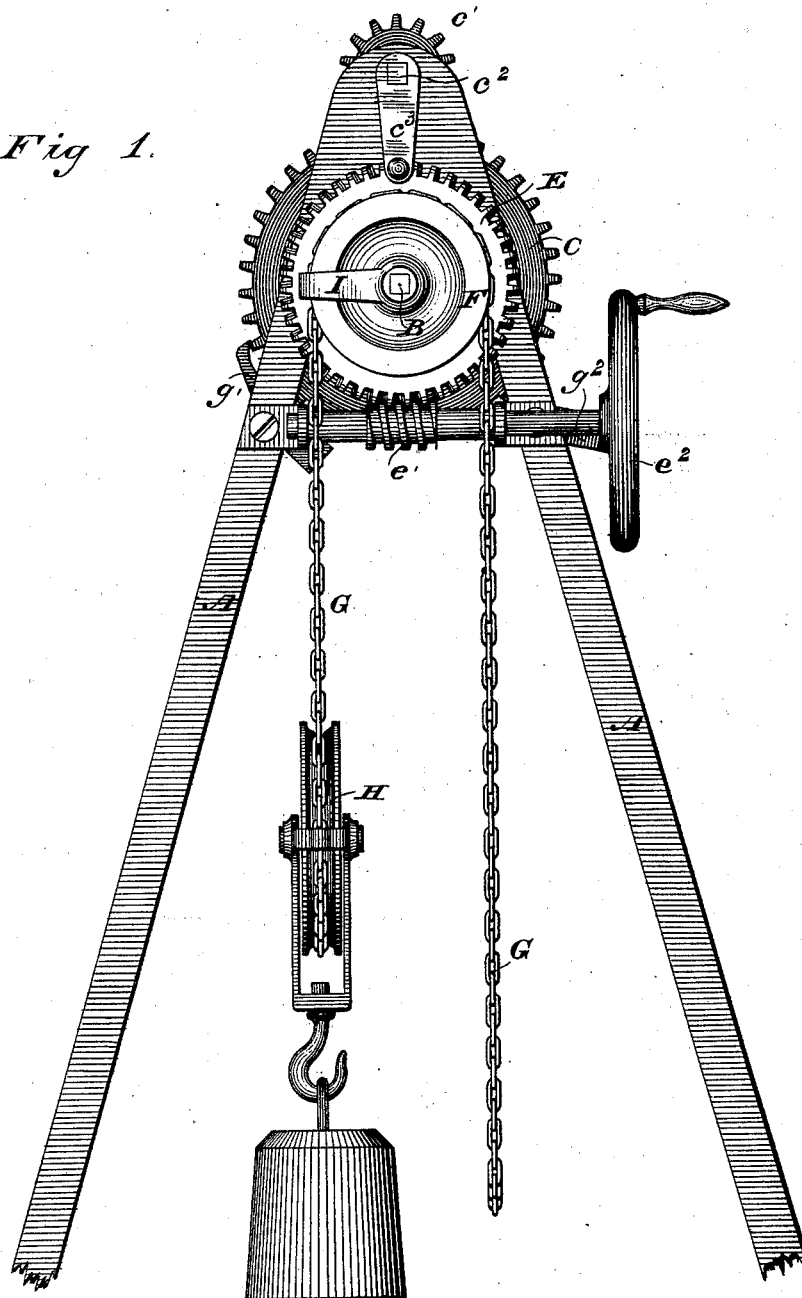


T. A. WESTON.  
Endless-Chain Hoisting-Machine.

**No. 216,298.**

**Patented June 10, 1879.**

*Fig 1.*



WITNESSES

Yrs a Skink  
Geo W. Buck

INVENTOR

*Thomas. A. Weston.*

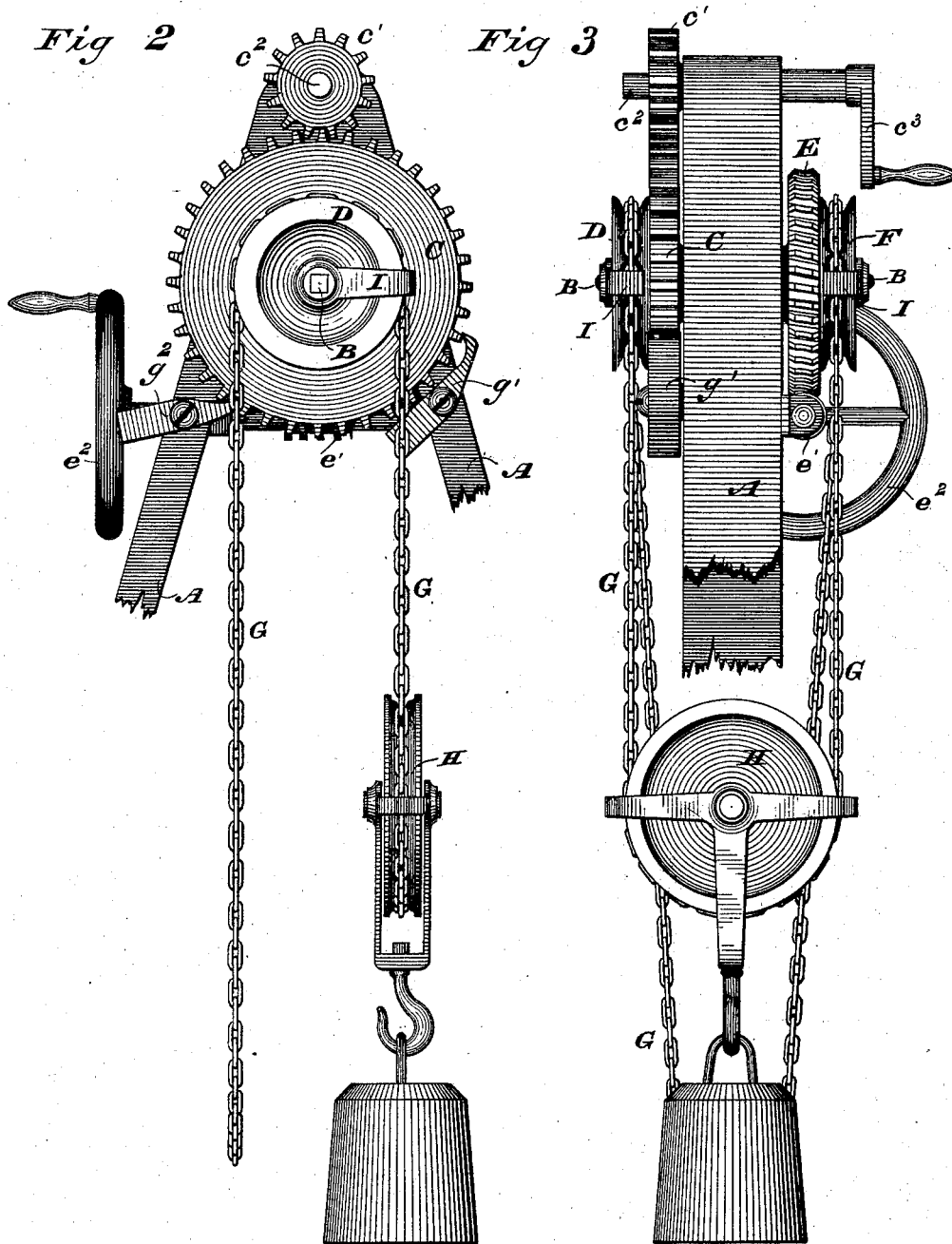
*By his Attorneys*

Thomas. A. Weston.  
By his Attorneys  
Baldwin, Hopkins, & Peyton.

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WITNESSES

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# UNITED STATES PATENT OFFICE.

THOMAS A. WESTON, OF STAMFORD, CONNECTICUT.

## IMPROVEMENT IN ENDLESS-CHAIN HOISTING-MACHINES.

Specification forming part of Letters Patent No. **216,298**, dated June 10, 1879; application filed November 11, 1878.

*To all whom it may concern:*

Be it known that I, THOMAS A. WESTON, of Stamford, in the county of Fairfield and State of Connecticut, have invented certain Improvements in Hoisting-Machines that I wish to designate an "Endless-Chain Hoisting Device," of which the following is a specification.

The object of my invention is to obtain increased safety, dispatch, and convenience in such mechanism by employing one distinct set of gearing to haul in a chain for hoisting, and another separate set for lowering or paying it off. The chain is an endless one, engaging at separate points with the two sets of gearing. I am thus enabled to dispense with all reversing motions, clutches, brakes, and disconnecting devices in the hoisting-gear necessary when it has to run backward. The hoisting sheave or drum being thus required to run in one direction only may be constantly checked or pawled by differential pawls or other checks against backward motion, to sustain the load when the hoisting motion ceases, so that the gearing is then relieved from strain; and in case of its failing at any time the pawls, which are always in action, prevent the fall of the load. The lowering sheave or drum being a separate one, may be permanently geared with an automatic governor or safety lowering devices, and the complication avoided of providing one and the same drum with all the devices required both for hoisting and lowering.

Other advantages also accrue to my invention, as will hereinafter appear.

In the accompanying drawings, which represent my invention in its most elementary form, Figure 1 is an elevation taken upon the lowering side of the machine. Fig. 2 is a similar view, showing the hoisting side, and Fig. 3 is an elevation at right angles with Figs. 1 and 2.

A is a frame, supporting a stationary shaft or axle, B, upon one end of which is placed a gear-wheel, C, securely joined to the toothed hoisting-sheave D. Upon the other end of the shaft is placed a worm-wheel, E, securely joined to the toothed lowering-sheave F.

An endless chain, G, is passed over and engaged with the sheaves D F, so as to form two

loops, and in the bight of one is placed the moving pulley H, provided with the usual yoke and hook for convenient attachment to the load.

The gear-wheel C is operated by a pinion,  $c^1$ , shaft  $c^2$ , and crank  $c^3$ , and has differential pawls  $g^1$   $g^2$  to check backward motion.

The worm-wheel E is operated by a worm,  $e^1$  and crank-wheel  $e^2$ .

I I are chain guides or keepers to guide and retain the chain in position upon the chain-sheaves.

The useful effect and saving of friction in spur-gearing being about two to one greater than in worm-gearing, my invention has the advantage of permitting spur-gearing to be employed for the hoisting motion, in which friction is an evil, uselessly consuming the driving power, and the employment of worm-gearing for lowering when the resisting friction is a benefit in retarding the too rapid descent of the load. This peculiarity of my invention, consisting of detaching the hoisting mechanism wholly from that for lowering, also permits any devices possessing exclusive advantages for either one purpose to be used for that purpose only. Thus, for instance, the nipping-levers of ships' windlasses, which, by alternate vibrations, transmit continuous rotary motion to a chain wheel or drum, but are incapable of reversing or lowering, may be employed for hoisting in my invention; and for lowering, in lieu of the worm and wheel, I can apply an ordinary friction-brake to the lowering chain-wheel F, or the automatic brake described in my United States Letters Patent bearing even date herewith. Thus the hoisting devices are left untrammelled and free to be arranged in any way most convenient for the one single function of hoisting, and so also with the lowering devices.

In lieu of a chain, an endless rope, cable, or band may be employed, with suitable modifications in the conformation of the sheaves D F to effect the necessary engagement therewith. Obviously the supporting-frame may be stationary or movable, or suspended in the manner of a pulley-block frame or yoke. Instead of placing the loops of the chain as represented in the drawings, one on each side of

the axis of the sheaves D F, the loops may hang diagonally to the axis and their bights intersect each other. In this case the moving block H would hang diagonally to the sheaves D F, and the loop containing it would have its side pendent from opposite sides or edges of the chain-sheaves, exactly as is the case with the endless chain of the well-known differential pulley of my United States Letters Patent No. 67,470, dated August 6, 1867.

The sheave F, although designed primarily to be used for lowering, is, when provided with the attached worm-wheel represented in the drawings, capable of hoisting also, and could be so used to adjust the position or height of the load with more extreme nicety than is possible with the spur-gear and retaining-pawls of the hoisting-sheave D; or, if desired, the said hoisting action of the worm and sheave F could be used simultaneously with the hoisting motion of the sheave D to give greater speed.

I claim as my invention—

1. The combination, in a hoisting-machine, of an endless chain or endless band, with separate hoisting and lowering sheaves or drums, separately operated by distinct gearing, substantially as described.

2. The combination, in a hoisting-machine, of an endless chain, rope, or band, G, a hoisting-sheave, D, and its driving-gear, a lowering-sheave, F, and its worm-gear E e', and the pulley-block H, substantially as described.

3. The combination, in a hoisting-machine, of an endless chain, G, gear-wheel C, sheave D, worm-gear E, block H, and pawls g<sup>1</sup> g<sup>2</sup>, substantially as described.

In testimony whereof I have hereunto subscribed my name.

THOS. A. WESTON.

Witnesses:

M. S. HOPKINS,  
WM. J. PEYTON.