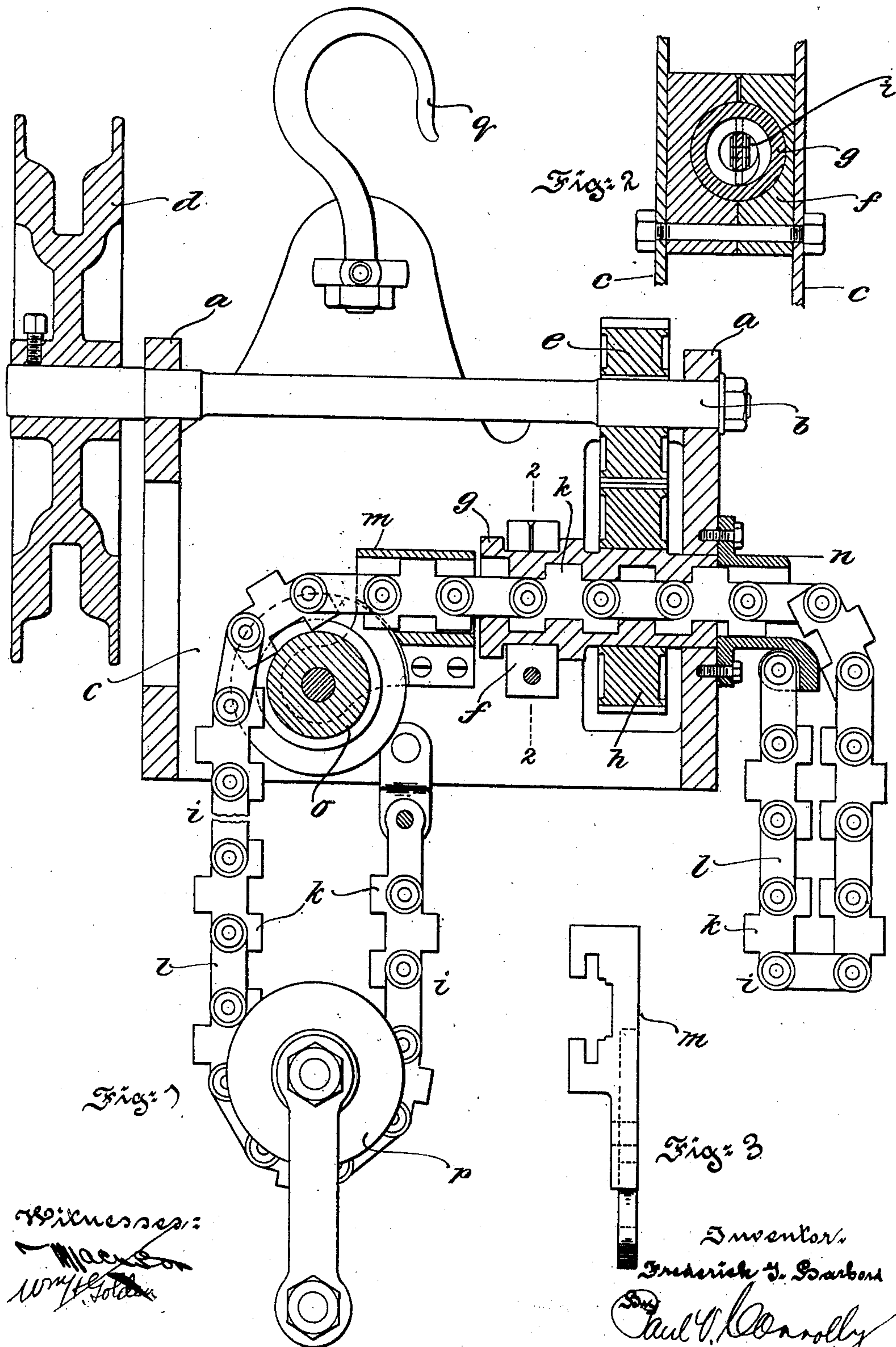


No. 837,904.

PATENTED DEC. 4, 1906.

F. G. HARBORD.  
HOIST.

APPLICATION FILED SEPT. 29, 1905. RENEWED NOV. 12, 1906.



Witnesses:  
*Wm. H. [Signature]*  
*Wm. H. [Signature]*

Inventor:  
*Frederick G. Harbord*  
*Paul V. Connolly*  
Att. in P.



# UNITED STATES PATENT OFFICE.

FREDERICK G. HARBORD, OF PHILADELPHIA, PENNSYLVANIA.

## HOIST.

No. 837,904.

Specification of Letters Patent.

Patented Dec. 4, 1906.

Application filed September 29, 1905. Renewed November 12, 1906. Serial No. 343,120.

*To all whom it may concern:*

Be it known that I, FREDERICK G. HARBORD, a subject of the King of Great Britain, residing at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a certain new and useful Hoist, of which the following is a specification.

One object of the present invention is to transmit motion from a revolving shaft without the use of sprockets to a chain of toothed links having engagement with an internally-threaded cylinder, whereby a vertical hoist of great power is effected with a comparatively little effort.

Other objects will hereinafter appear.

The invention consists of the improvements hereinafter described and finally claimed.

The nature, characteristic features, and scope of the invention will be more fully understood from the following description, taken in connection with the accompanying drawings, forming part hereof, and in which—

Figure 1 is a central sectional view of a hoist embodying the invention. Fig. 2 is a detail view taken on the sectional line 2 2 of Fig. 1, and Fig. 3 is a detail view of a chain-guide.

In the drawings, *a* represents end pieces forming a bearing for the power-transmitting shaft *b* and are held together by side plates *c* by means of nuts and bolts, the whole constituting a frame. The shaft *b* carries a wheel or pulley *d*, adapted to receive a hand-chain (not shown) and a pinion *e*. Between the side plates *c* and bolted thereto (see Figs. 1 and 2) there is a bearing-block *f*, which carries an internally-screw-threaded cylinder *g*. As shown, this cylinder is provided with a gear-wheel *h*, which meshes with the pinion *e*. *i* is a chain provided with extensions or teeth *k*. These teeth, it will be observed, are spaced so that there is always one tooth opposite two teeth upon a given link and that there are spacers *l* between such toothed links. This is important in order to permit of the chain properly engaging with the thread of the cylinder *g*. Opposite each end of the cylinder *g* is a guide, as *m* and *n*, suitably slotted, as shown in Fig. 3, to accommodate the chain *i* and insure its passing to or from the cylinder in proper alinement in order to prevent undue wear or strain upon the

worm. A suitable grooved wheel *o*, journaled to the guide *m*, is also provided, over which the chain *i* passes, and said chain has its end secured to the said plates *c*. A wheel *p*, which acts as an idler and is similar in construction to the wheel *o*, is rotatably supported by the chain and may be provided with any suitable means for attachment to objects to be hoisted. In using the hoist the same may be suspended by means of the part *q*.

It will be obvious to those skilled in the art to which the invention appertains that modifications may be made in detail without departing from the spirit of the invention. Hence the same is not limited further than the prior state of the art may require; but,

Having thus described the nature and objects of the invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A hoist comprising a frame equipped for suspension carrying a longitudinally-arranged shaft a driving-wheel and a pinion mounted thereon, an internally-screw-threaded cylinder parallel with and located beneath the shaft, a gear-wheel adapted to mesh with the pinion carried by the cylinder, a chain and its complemental projections for engaging the cylinder said chain having its opposite ends secured to the frame, guides and a guide-wheel for the chain and an idler and its attachment means carried by the chain, substantially as described.

2. A hoist comprising a frame equipped for suspension, a longitudinally-arranged shaft journaled thereto, a driving-wheel adapted to receive a hand-chain and a pinion mounted upon the shaft, an internally-screw-threaded cylinder carried within the frame a gear-wheel upon the cylinder adapted to mesh with the pinion, a chain and its complemental projections for engaging the cylinder said chain having its respective ends secured to the frame, slotted guides and a guide-wheel for the chain and an idler and its complemental attachment means carried by the chain, substantially as described.

In testimony whereof I have hereunto set my hand and seal.

FREDERICK G. HARBORD. [L. s.]

In presence of—

W. J. JACKSON,  
WM. H. GOLDEN.