

(No Model.)

C. E. ALBRO.  
Hoisting Apparatus.

No. 232,386.

Patented Sept. 21, 1880.

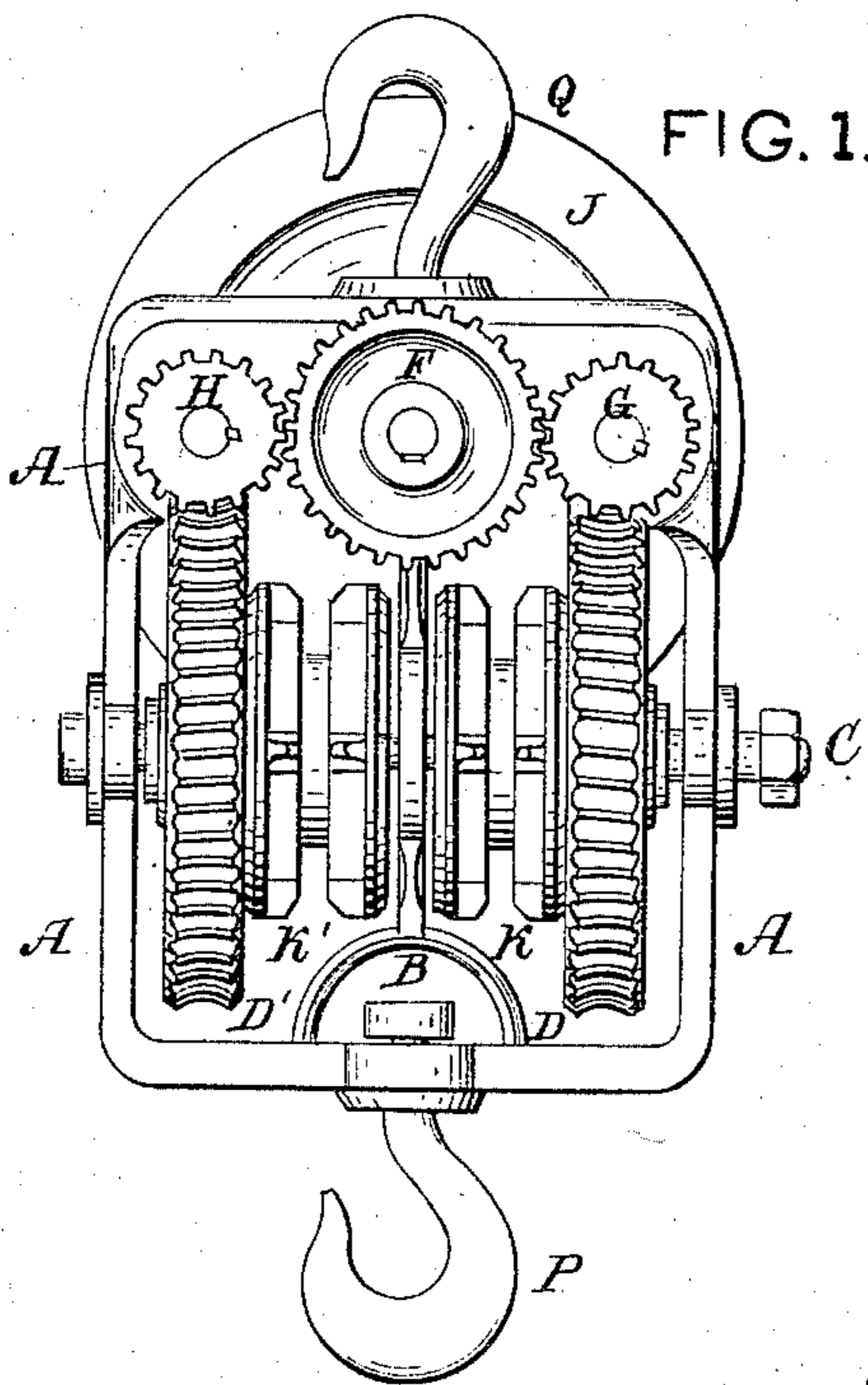


FIG. 1.

FIG. 2.

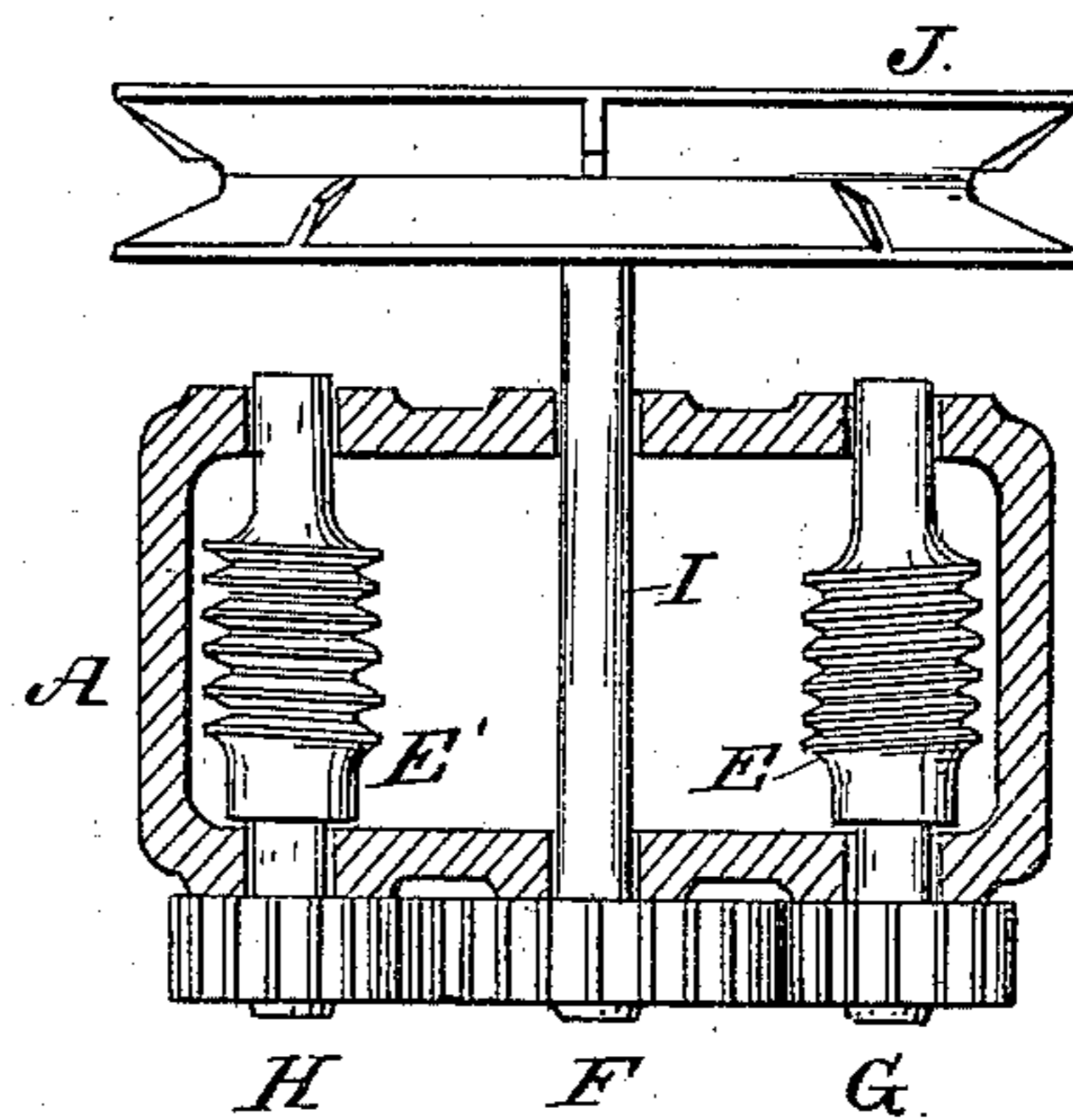


FIG. 3.

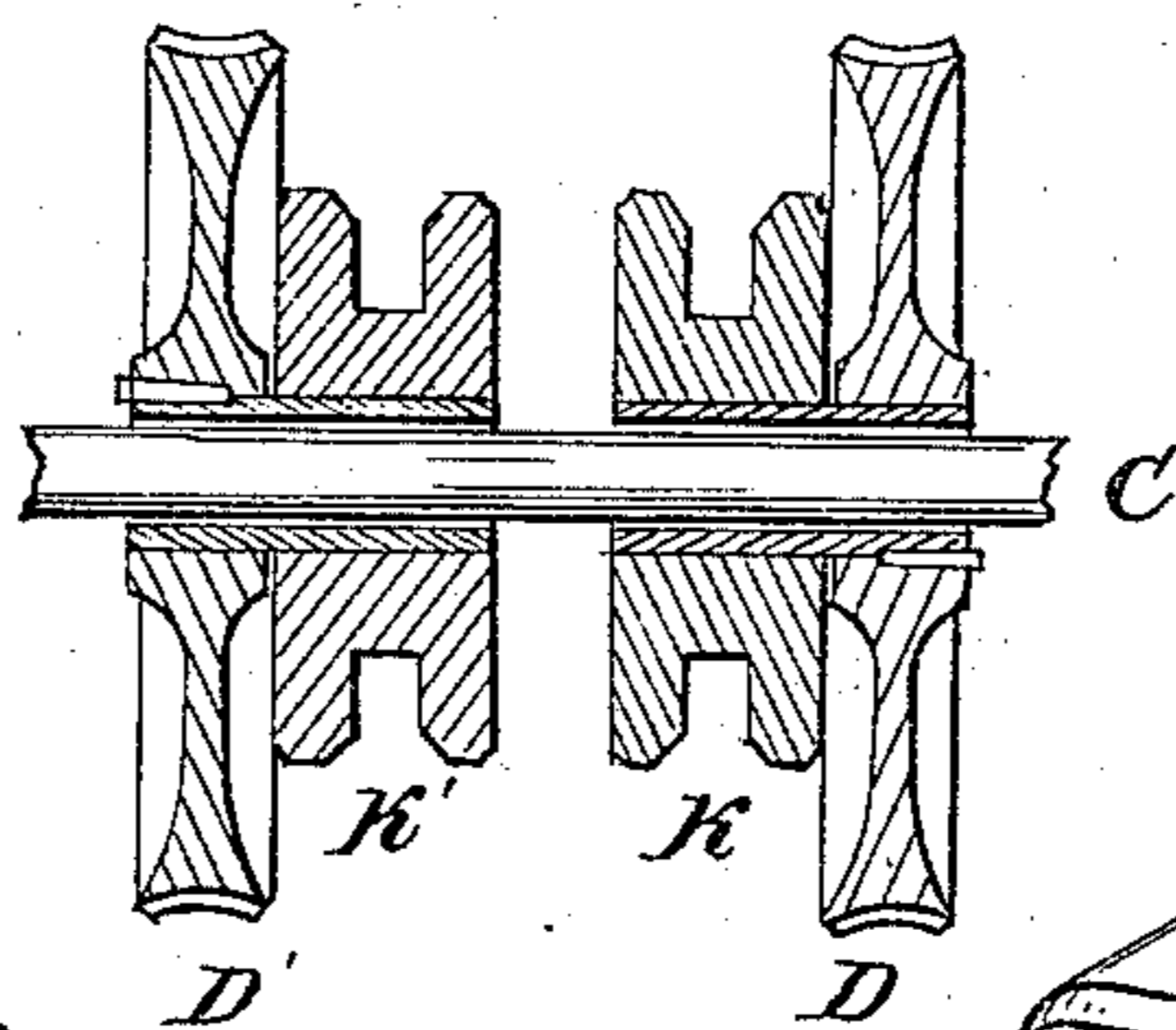


FIG. 5.

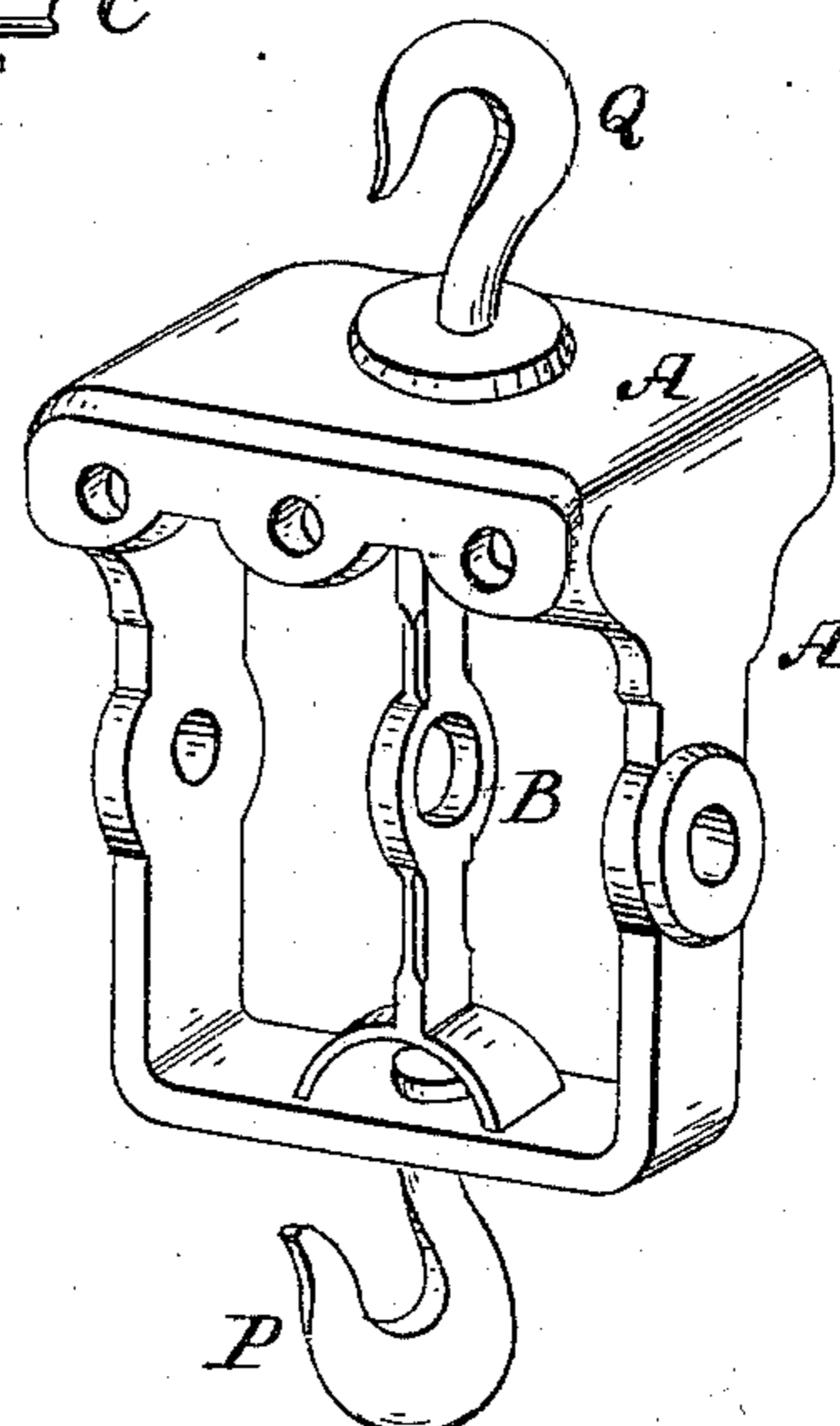
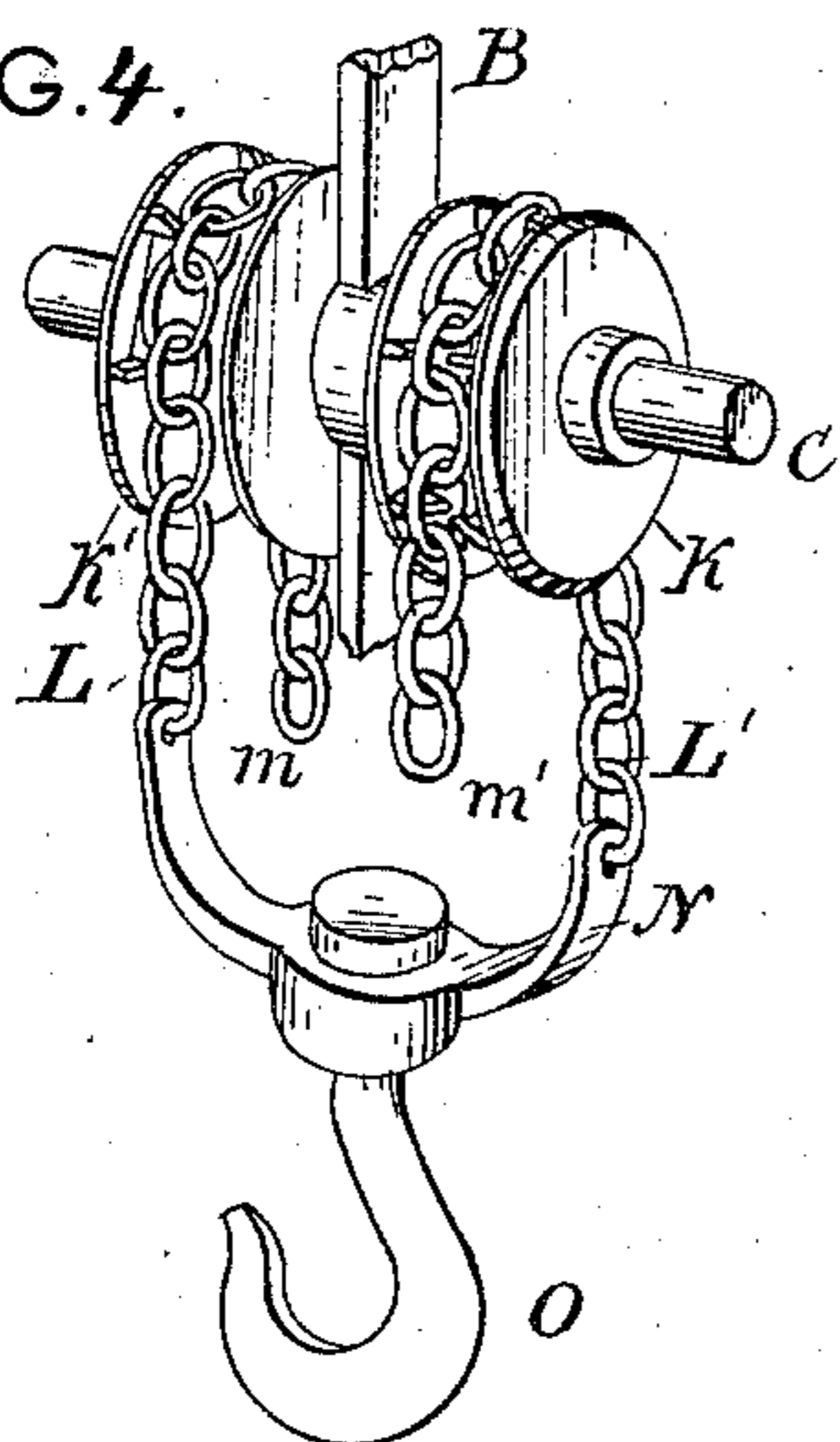


FIG. 4.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

CHARLES E. ALBRO, OF CORTLAND VILLAGE, NEW YORK.

## HOISTING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 232,386, dated September 21, 1880.

Application filed June 18, 1880. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES E. ALBRO, of Cortland Village, in the county of Cortland and State of New York, have invented certain new and useful Improvements in Self-Sustaining Hoisting Apparatus; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention relates to certain improvements upon the invention for which reissued Letters Patent No. 9,153 were granted to me the 13th day of April, 1880, for self-sustaining differential hoisting apparatus, in which the working mechanism is located in a suitable frame-work that can be suspended like an ordinary pulley-block; and my invention consists in certain improvements in the frame and the method of mounting the pulley-shaft and worm-gearing therein, whereby the utmost strength and compactness may be obtained. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 represents a side elevation of my improved hoisting apparatus; Fig. 2, a horizontal sectional view with the pulleys removed; Fig. 3, a sectional view of the pulleys and gear-wheels detached; Fig. 4, a perspective view of the pulleys detached, and Fig. 5 a perspective view of the supporting-frame with the remaining parts detached.

The letter A indicates the frame-work, which is made in the form shown in the drawings, of metal, and of sufficient size and strength to receive the various parts and withstand the strain to which it will be subjected.

The letter B indicates a central upright bifurcated at its ends to straddle the ends of the swivel-hooks and permit the frame to turn freely thereon.

C indicates a transverse shaft passing through the sides of the frame and the central upright and having bearings therein.

D D' indicate the gear-wheels with which the screw-worms E E' intermesh, and F indicates a gear-wheel mounted on a driving-shaft,

I, which is provided with a sprocketed driving-pulley, J, at one end. The wheel F intermeshes with the gear-wheels G and H, which are mounted on the ends of the worms E E', and serves to impart motion to said worms. The wheels D D' move in opposite directions, and their teeth are inclined in order to facilitate the working of the worms into the teeth, and give additional strength to the wheels by enabling them to be made wider.

The letters K K' indicate the differential pulleys, which are grooved and sprocketed at their peripheries, as usual. The said pulleys are provided with projecting bushes, to the ends of which the worm-gear wheels D D' are keyed, the bushes being adapted to turn freely on the shaft C.

The letters L L' indicate the lifting-chains, the free ends *m m'* of which are passed in reverse directions over the respective pulleys K K'; and O indicates a hook swiveled to the cross-bar N, secured to the chains L L'.

The letters P and Q indicate similar hooks swiveled to the upper and lower parts of the frame A.

It will be perceived that in the present instance the worm-gear wheels are arranged at each side of the pulleys, and that the supporting-shaft of said pulleys has a bearing at its center instead of at the ends simply, thus imparting great strength to the device.

The operation of my improved device is similar to the device for which Letters Patent were granted to me, as before mentioned, and will be readily understood in connection with the above description without further explanation.

My present improvement possesses all the advantages of my former invention, besides the additional advantages above enumerated; and it can be employed with both of the chain-pulleys in operation at once, or when great power is not required one of the pulleys can be dispensed with and the chain passed over the other one simply, and a self-sustaining hoisting apparatus still obtained.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a hoisting apparatus, the combination, with one or more pulleys of the worm-gear wheels, located one on each side of the chain-

pulleys, and the vertical central upright forming a bearing for the pulley-shaft between the two pulleys, substantially as specified.

2. In a hoisting apparatus, the chain-pulleys  
5 provided with bushings, the worm - wheels keyed to said bushings, the whole being mounted on a single shaft, and the screw-worms and their operating mechanism, substantially as and for the purposes specified.

10 3. In combination with the frame provided with swivel-hooks, the central upright forming a bearing for the pulley-shaft between the pul-

leys, and bifurcated at its ends to straddle the heads of the hooks and permit them to turn freely in their bearings, substantially as specified. 15

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

CHARLES E. ALBRO.

Witnesses:

J. E. EGGLESTON,  
C. E. SELOVER.