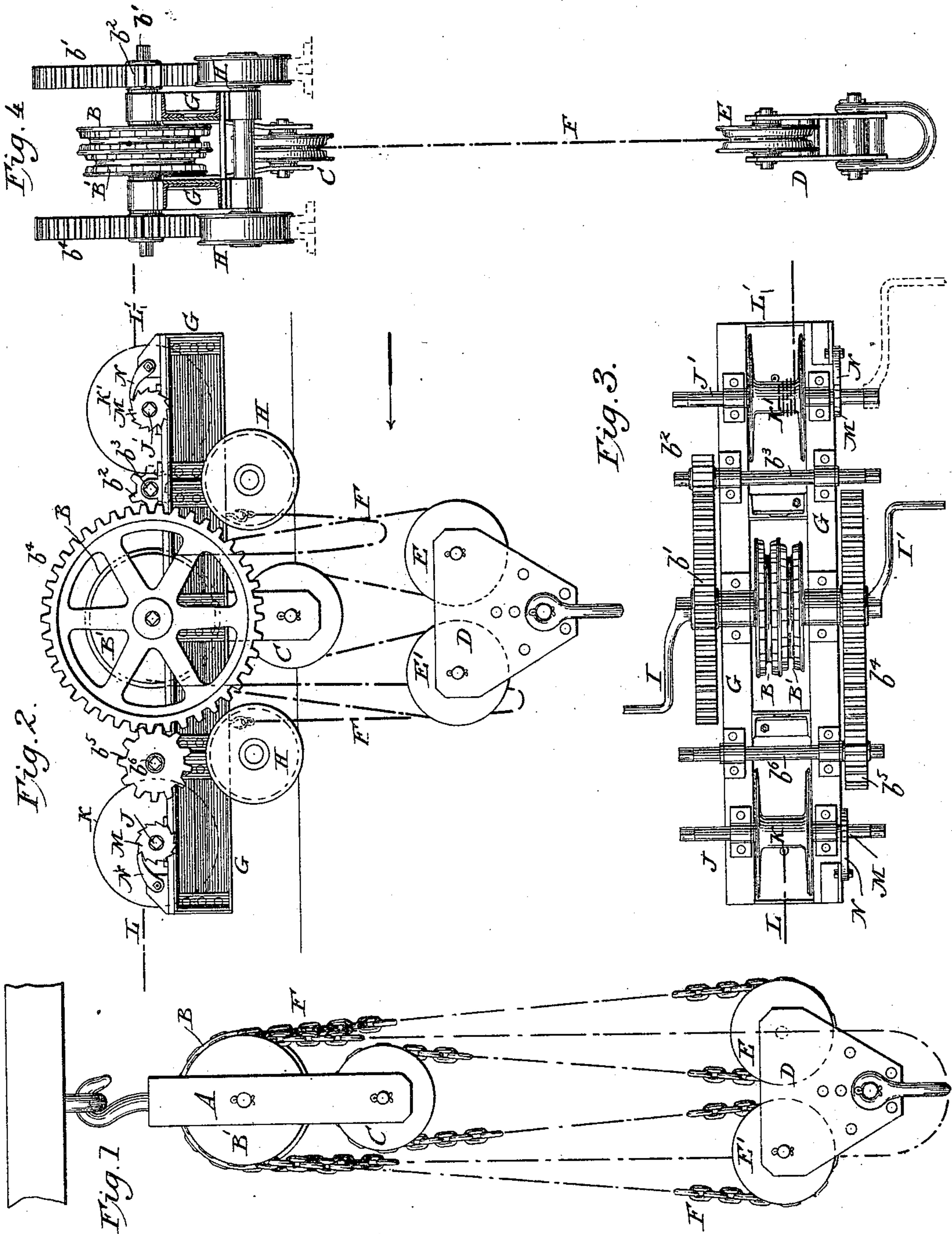


(No Model.)

O. BATES.  
HOISTING MECHANISM.

No. 464,786.

Patented Dec. 8, 1891.



Witnesses  
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# UNITED STATES PATENT OFFICE.

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## HOISTING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 464,786, dated December 8, 1891.

Application filed July 18, 1891. Serial No. 399,967. (No model.)

*To all whom it may concern:*

Be it known that I, ONWARD BATES, of Chicago, county of Cook, and State of Illinois, have invented a new and useful Improvement in Hoisting Mechanism, of which the following is a specification.

My invention relates to improvements in differential hoisting mechanism and pertains, first, to the construction of the hoisting mechanism proper, applicable to both stationary and traveling hoisting mechanisms, and, second, to improved traveling hoists in which the above-mentioned improvements are embodied with others.

In the accompanying drawings, Figure 1 is a side elevation of a differential hoist constructed in accordance with my invention. Fig. 2 is a side elevation of a traveling hoist constructed in accordance with my invention for use on an overhead track or support. Fig. 3 is a top plan view of the mechanism shown in Fig. 2. Fig. 4 is an elevation of the mechanism shown in Figs. 2 and 3, looking in the direction indicated by the arrow.

Referring to Fig. 1, A represents a suspending frame or housing, and B B' an ordinary differential sheave—that is to say, a double sheave having its two sides of different diameters, with peripheral pockets in both to receive the hoisting-chain.

C is a sheave independently mounted in the lower part of the housing A.

D is the hook-block for carrying the load, provided with two independent sheaves E E'.

F is the endless hoisting-chain, passed around the larger portion B of the differential sheave, thence downward around sheave E, upward over fixed sheave C, downward under sheave E', and finally upward around the smaller portion B of the differential sheave.

The device is operated by pulling on either side of the loose fold of the chain, as in the common differential hoist. It differs from hoists as ordinarily constructed in that it contains a supplemental sheave C and the second sheave in the hook-block. The advantage of this construction lies in the fact that I thus increase the power or efficiency of the hoist without increasing the load or friction of the differential sheave.

Passing now to the consideration of the con-

struction represented in Figs. 3, 4, and 5, G represents a carriage provided with sustaining-wheels H, adapted to travel on an overhead track or support, such as the carriage of a traveling crane or the jib of a derrick.

B B' represent the differential sheave, similar to that in Fig. 1, mounted on a horizontal shaft in the carriage.

C is the supplemental sheave, mounted in arms in the under side of the carriage; D, the hook-block, and E E' the two sheaves in the hook-block.

F is the hoisting-chain, passed around the various sheaves in the same manner as in Fig. 1, its two ends being for convenience hooked up on the carriage out of the way.

The action of the chain and sheaves in hoisting is precisely the same as in the first figure.

In order to permit the power and speed to be modified according to the character of the load to be handled, the shaft of the differential sheave is adapted at its two ends to receive hand-cranks I I'. The shaft is also provided at one end with a large gear-wheel  $b'$ , engaging a pinion  $b^2$  on a shaft  $b^3$ , which is mounted in bearings on the carriage and adapted at its ends to receive the cranks before mentioned. I also provide the shaft of the differential sheave at its opposite end with a second gear-wheel  $b^4$ , engaging a pinion  $b^5$  on a shaft  $b^6$ , also adapted to receive the cranks, this second pinion and gear differing in size from those first mentioned, so as to operate the sheaves at greater speed but less power.

In order to prevent the carriage from shifting accidentally and to admit of its being readily moved to carry the load, as demanded, I mount in opposite ends of the carriage duplicate shafts J J', carrying winding-drums K K', to which they are attached, respectively, two chains L L', leading in opposite directions to fixed supports. The ends of the shafts J J' are adapted to receive the operating cranks before mentioned, so that by turning the appropriate shaft the chain may be wound upon its drum and the carriage moved in one direction, the chain at the opposite side being automatically unwound.

The drum-shafts are provided, as shown, with ratchet-wheels M, engaged by dogs N,



whereby the drums may be locked against rotation, so that they will through the medium of the chains hold the carriage in position.

It will be observed that under the arrangement shown I provide for operating the differential sheaves in either of three ways—that is to say, by the application of cranks directly to their shafts, or with greater effect by the application of the cranks to the shaft  $b^6$ , or with still greater effect by the application of the cranks to the shaft  $b^3$ .

It will of course be understood that the two ends of the hoisting-chain may be joined, as in the first example, so as to admit of the sheaves being operated by means of the chain.

Having thus described my invention, what I claim is—

1. In a hoisting apparatus, a sustaining-frame containing the differential sheave and the intermediate sheave C on an independent and lower axis, in combination with the hook-block, the pulleys E E', mounted therein in the same vertical plane, and the chain passed around the differential sheave and thence downward around the lower sheaves and upward between them to sheave C, as shown.

2. The wheeled frame or carriage and a sup-

porting-track therefor, in combination with a hoisting-gear mounted therein, the two winding-drums, also mounted therein and provided with locking devices, and the chains extended from said drums in opposite directions as a means of shifting and holding the carriage.

3. A supporting-frame, in combination with the differential sheave, a gear-wheel attached to the sheave, a pinion engaging the gear and an independent sheave, all mounted in the frame, a hook-block provided with two sheaves, a chain passed to and fro around the various sheaves, as shown, and a device, as a crank, for applying power either to the differential sheave or to the pinion at will.

4. In combination with the differential sheave, its two gear-wheels, and the two pinions, an operating-crank adapted for application to the sheave or to either pinion at will.

In testimony whereof I hereunto set my hand, this 22d day of June, 1891, in the presence of two attesting witnesses.

ONWARD BATES.

Witnesses:

W. H. FINLEY,

W. W. CHRISTIE.