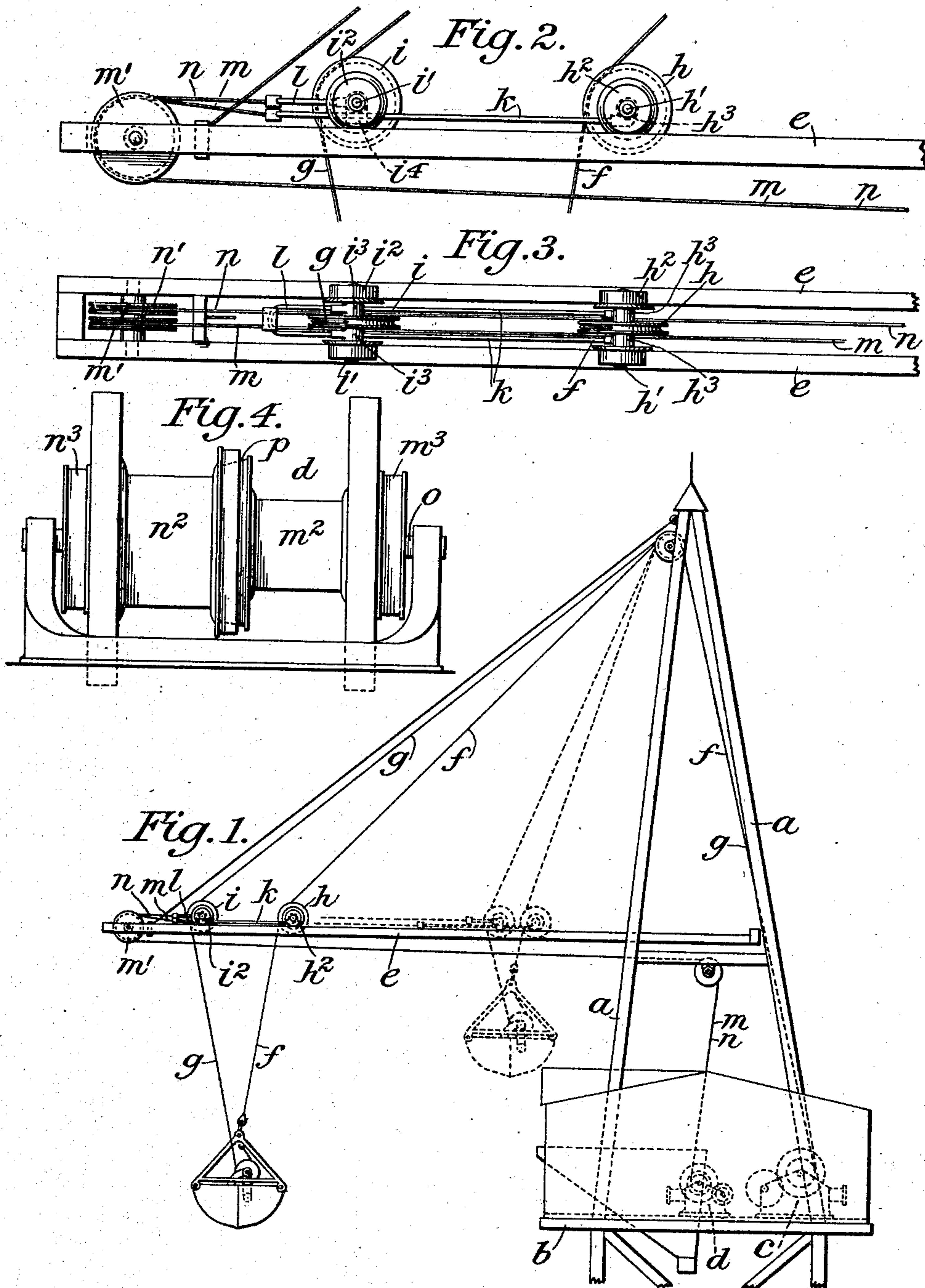


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C. W. HUNT.
HOISTING APPARATUS.
(Application filed Mar. 22, 1902.)

(No Model.)



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UNITED STATES PATENT OFFICE.

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HOISTING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 714,700, dated December 2, 1902.

Application filed March 22, 1902. Serial No. 99,391. (No model.)

To all whom it may concern:

Be it known that I, CHARLES WALLACE HUNT, a citizen of the United States, residing in West New Brighton, borough of Richmond, city of New York, State of New York, have invented certain new and useful Improvements in Hoisting Apparatus, of which the following is a specification, reference being had to the accompanying drawings, forming a part hereof.

In the operation of steam-shovels the weight of the load is sustained in part by the rope which opens and closes the shovel and in part by the rope which is directly attached to the shovel, and such ropes pass over sheaves, which are usually placed quite close together on the rigid trolley-frame, which travels on the boom or other support therefor, and are thence conducted to the winding-drums, by which they are respectively controlled. The distance apart of the two sheaves on the trolley-frame is not sufficient ordinarily to overcome the tendency of the ropes to twist and of the load to rotate, particularly when the vertical distance between the load and the trolley is considerable. The rotation of the load would render the operation of the hoisting apparatus at high speed impossible, and various expedients have heretofore been resorted to for the purpose of checking the tendency of the load to rotate; but all of such expedients hitherto devised are more or less objectionable.

It is the purpose of this invention to provide improved means for overcoming the tendency of the load to rotate in apparatus of the character referred to, which shall be free from the objections to other devices intended for the same purpose and shall operate satisfactorily under all conditions, offering no hindrance to the operation of the apparatus and permitting all of the desirable conditions of operation to be fulfilled. To this end the trolley-sheaves over which the two ropes pass are arranged to move relatively during the hoisting or translation of the load, so that they shall be sufficiently far apart to overcome the tendency to rotate where such tendency is greatest and shall be close together where the tendency to rotate is slight.

Although reference is made herein to a shovel having an opening and a closing rope,

it will be obvious that so far as the present invention is concerned the second rope need not have the function of opening and closing the shovel, but may be a second rope attached in any manner to a load of any description.

The invention will be more fully described hereinafter with reference to the accompanying drawings, in which for purposes of illustration and explanation it is shown as applied to a hoisting apparatus of well-known form, in which the second rope is primarily intended to open and close the shovel, but incidentally sustains a portion of the load during the hoisting and translation thereof.

In the drawings, Figure 1 is a view in side elevation of so much of a hoisting apparatus of the character referred to as is necessary to enable the invention to be understood, the engines and drums for effecting the desired movements of the loads being indicated by dotted lines. Fig. 2 is a detail side view showing a portion of the boom with the separable trolleys mounted thereon. Fig. 3 is a plan view of the parts shown in Fig. 2. Fig. 4 is a detail view showing the drum, by which the separable trolleys are controlled.

In Fig. 1 an ordinary "steeple-tower" *a* is represented as provided, as usual, with a platform *b*, upon which are mounted the engine and drums (indicated at *c*) for hoisting and lowering the load and for opening and closing the shovel and at *d* the engine and drums for effecting or controlling the translation of the load. A boom *e*, secured at a suitable height, supports the trolleys or guides over which run the hoisting-rope *f* and the opening-and-closing rope *g*, which are respectively connected to the hoisting and opening and closing drums of the mechanism, (indicated at *c*), as usual in apparatus of this character. The guides *h* and *i*, on which the ropes *f* and *g* are guided, instead of being mounted in a single rigid frame, which may travel on the boom *e*, are arranged to have relative movement during the movement of the load. It will be obvious as this description proceeds that such relative movement may be provided for in different ways; but the description of the means chosen for illustration in the drawings will be sufficient to enable the nature of the invention to be un-

derstood. As represented in the drawings, each guide-sheave h and i is mounted upon the corresponding axle h' i' , which receives the wheels h^2 i^2 for the support of the trolleys on the boom. Collars h^3 on the shaft or axle h' furnish points of attachment for the reach or guide-arm k , which may be conveniently formed as a bow-iron, as represented in Fig. 3. Collars i^3 on the shaft i' likewise furnish points of support for a similar but shorter bow-iron l , and may also be provided with guides i^4 , through which pass the limbs of the bow-iron k . The bow-iron k of the inner trolley has secured to it a haulage-rope m , which passes over a guide-sheave m' at the outer end of the boom e , and thence to a winding-drum m^2 , which forms part of the mechanism indicated at d in Fig. 1. The bow-iron l of the outer trolley has secured to it a haulage-rope n , which passes over a guide-sheave n' at the outer end of the boom to a second drum n^2 , which also forms part of the mechanism indicated at d in Fig. 1. The drums m^2 and n^2 are of different sizes, so that they shall take in or pay out the ropes m and n at different rates of speed. Both drums may be mounted upon a common driving-shaft o , may be provided with separate brakes, as at m^3 and n^3 , and may be provided with a clutch (indicated at p) by which the two drums may be driven together when one of the drums is fast to the shaft o and the other is mounted loosely thereon.

In the operation of the improved apparatus as represented in the drawings when the load is at its lowest point the guides h and i are separated, so that the tendency of the ropes f and g , which pass over them, to rotate is overcome, the trolleys being held in their relative positions by the application of the brakes to the drums m^2 and n^2 , so that the ropes m and n resist the inward stress exerted upon the trolleys through the ropes f and g . When it is desired to permit the translation of the load to begin, whether the load has been raised to its highest point or not, the brakes m^3 and n^3 are released and the drums m^2 and n^2 are engaged by the clutch p , so that they rotate together, paying out the ropes m and n to permit the trolleys to move inward under the stress of the ropes f and g . As the drum n^2 , which is connected to the outer guide i , is larger than the drum m^2 , which is connected to the inner guide h , the rope n will be paid out faster than the rope m and the guide i will consequently approach the guide h as they move inward until the guides are close together, as indicated by dotted lines in Fig. 1. When the load is at its highest point, as indicated by dotted lines, the tendency of the load to rotate will be at its minimum and may be neglected, while the ropes f and g are brought close together and are therefore in the most desirable position for the discharge of the load. When the movement of the parts is reversed and the trolleys are drawn outward

on the boom by the ropes m and n , the rope n will be taken up faster by reason of the greater diameter of the drum n^2 than the rope m , so that the guides will be separated as they are drawn out until they reach their maximum separation. It will be understood that by independent movement of the drums m^2 and n^2 the separation of the trolleys can be controlled within limits, as may be desired. It will also be understood that the drums themselves may be varied and that various other changes in the construction and arrangement of parts may be made, and it is not intended to limit the invention herein disclosed to the particular construction and arrangement of parts shown and described herein. Other embodiments of the fundamental invention which is herein disclosed are shown and described in other applications and, in connection with the present embodiment, will suggest other variations which may be particularly adapted to special uses.

I claim as my invention—

1. In a hoisting apparatus, the combination of hoisting-ropes, separable guides over which said ropes severally pass, and means whereby the relative positions of said guides are changed during the movement of the load.
2. In a hoisting apparatus, the combination of hoisting-ropes, separable trolleys having guide-sheaves for said ropes respectively, a support for the trolleys, and means whereby the relative positions of the trolleys are changed during the movement of the load.
3. In a hoisting apparatus, the combination of hoisting-ropes, separable guides for said ropes respectively, and drums of different sizes connected respectively to said guides to effect movement thereof.
4. In a hoisting apparatus, the combination of hoisting-ropes, separable trolleys having guide-sheaves for said ropes respectively, a support for said trolleys and drums of different sizes connected to said trolleys respectively to effect movement thereof.
5. In a hoisting apparatus, the combination of hoisting-ropes, separable trolleys having guides for said ropes respectively, a support for said trolleys, an arm extended from one of said trolleys through a guide on the other of said trolleys, and means whereby the relative positions of the trolleys are changed during the movement of the load.
6. In a hoisting apparatus, the combination of hoisting-ropes, separable trolleys having guides for said ropes respectively, a support for said trolleys, an arm extended from one of said trolleys through a guide on the other of said trolleys, and drums of different sizes connected to said trolleys respectively.

This specification signed and witnessed this 17th day of March, A. D. 1902.

CHARLES WALLACE HUNT.

In presence of—

CHAS. E. SIMONSON,
W. B. GREELEY.