No. 714,701. Patented Dec. 2, 1902.

C. W. HUNT.

HOISTING APPARATUS.

(Application filed Mar. 26, 1902.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

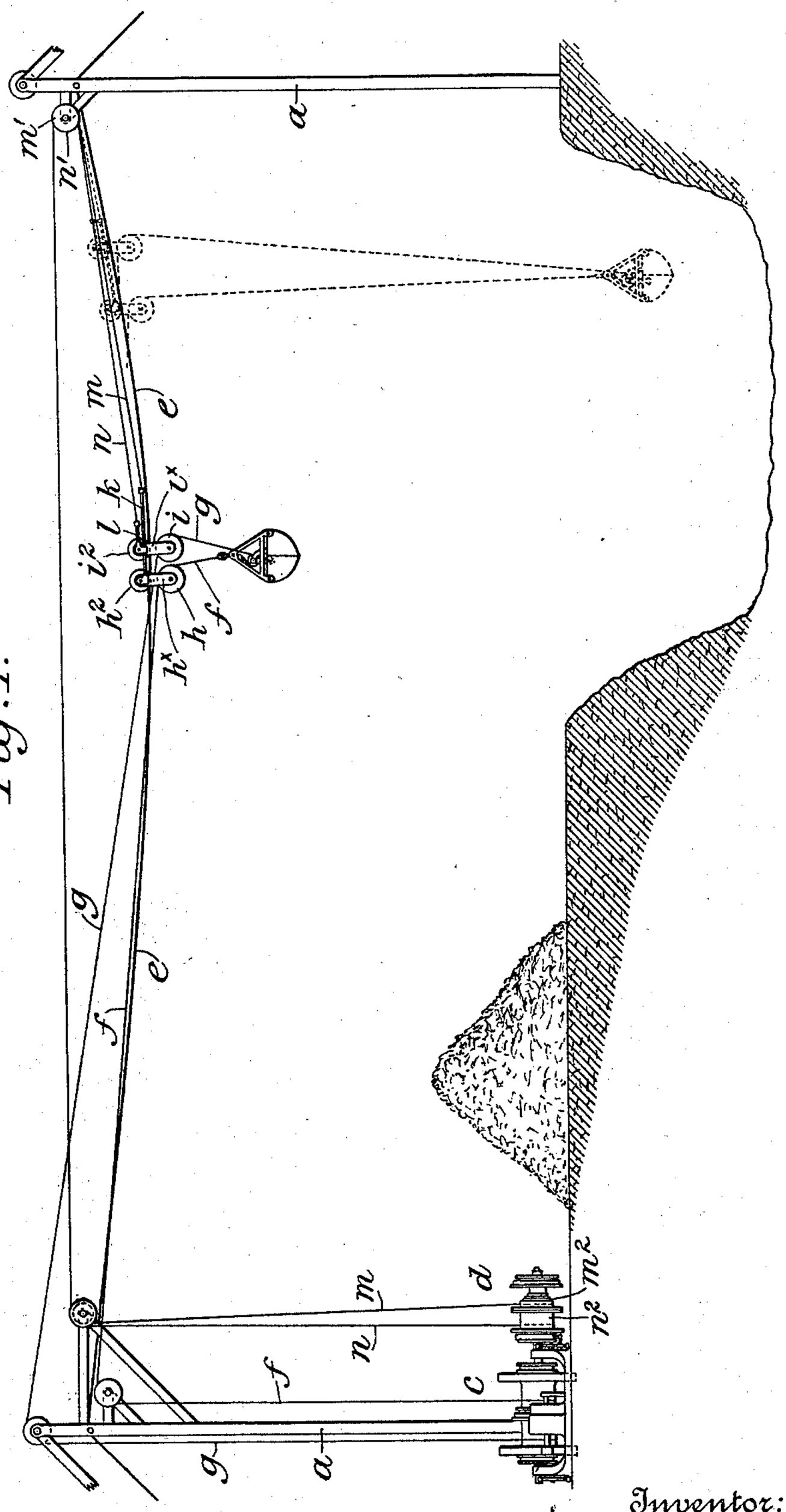

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Fig. 2.

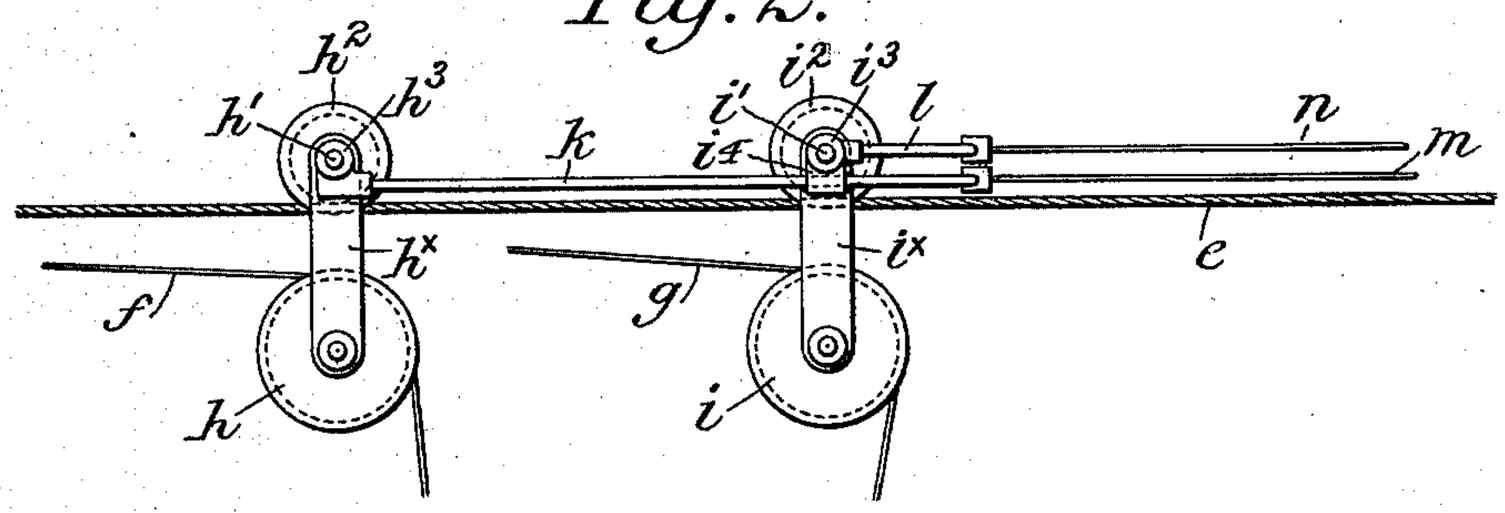


Fig. 3.

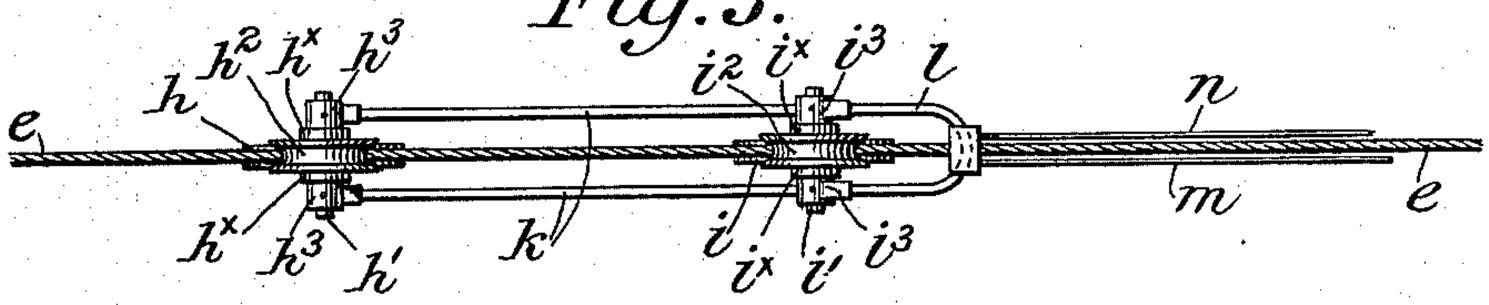
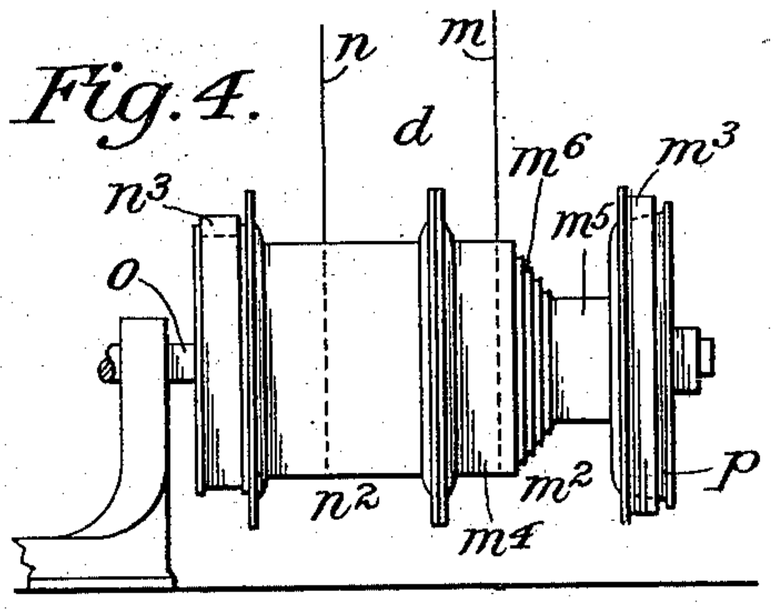


Fig. 4.



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UNITED STATES PATENT OFFICE.

CHARLES WALLACE HUNT, OF WEST NEW BRIGHTON, NEW YORK.

HOISTING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 714,701, dated December 2, 1902.

Application filed March 26, 1902. Serial No. 100,035. (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 another application, filed March 22, 1902, Serial No. 99,391, are disclosed means whereby in hoisting apparatus in which two ropes are connected to the load and share in sustaining it the guides over which such ropes pass, respectively, from the load to or toward their respective controlling-drums are caused to separate more or less, according to the position of the load, and through their separation to overcome the tendency of the load to rotate. In that application, wherein it is intended to cover the invention in its broadest aspect, the drums which control the guides, respectively, are shown as cylindrical drums of unequal diameter, whereby the relative change of position of the guides goes on during the translation of the load if the translating-drums are rotated together. This arrangement answers all requirements when the translation of the load is comparatively short; but when the translation of the load is comparatively long, as in excavation-work, it is desirable that the relative change in position of the guides be accomplished during a portion only of the movement of the load, so that they shall thereafter travel at the same rate, either when separated or close together. It is the object of this invention to provide means whereby this desired result can be accomplished; and to this end in accordance with the invention one of the drums is modified in form, as will be more particularly set forth hereinafter in connection with the description of a complete apparatus, with reference to the accompanying drawings, in which for purposes of explanation the invention is illustrated as embodied in a convenient and practical form of apparatus.

In the drawings, Figure 1 is a general view illustrating the application of the present improvement to an apparatus arranged for excavating and in which the translation of the load is considerable. Fig. 2 is a detail side view, on a larger scale, showing the relation of the guides for the hoisting-ropes. Fig. 3 is a plan view of the parts shown in Fig. 2. Fig. 4 is a detail view illustrating the relation of the drums which effect or control the movement of the guides.

In Fig. 1 of the drawings suitable towers *a* are represented as mounted upon opposite sides of an excavation, the drums and driving mechanism for hoisting and lowering the load and for opening and closing the shovel being indicated generally at *c*, while the drums for effecting or controlling the translation of the load are likewise indicated generally at *d*. A cable *e*, stretched from tower to tower, supports the guides over which run the hoisting-rope *f* and the shovel opening and closing rope *g*, which are respectively connected to the hoisting-drum and to the opening and closing drum of the mechanism indicated at *c*, as usual in apparatus of this character. The guides above referred to are arranged to have relative movement during the movement of the load, substantially as set forth in the application above referred to. Each of the guides *h* and *i* may be supported by a link $h^{\times}$ and $i^{\times}$, respectively, collars h^3 and i^3 on said links engaging the corresponding axles h' and i' of the trolley-wheels h^2 and i^2, which run on the cable *e*. A reach or guide arm *k*, which may be conveniently formed as a bow-iron, as represented in Fig. 3, may be secured to the collars h^3, the limbs of such bow-iron *k* passing through guides i^4, formed on the collars i^3, to which a similar but shorter bow-iron *l* is secured. The bow-iron *k* of the inner trolley has secured to it a rope *m*, which passes over a guide-sheave m' near the outer tower *a* and thence over a suitable guide to the 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 rope *n*, which passes over a similar guide-sheave n' near the outer tower *a* and another suitable guide to a second drum n^2, which also forms part of the mechanism indicated at *d* in Fig. 1. Both drums m^2 and n^2 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 if one drum is fast on the shaft o and the other is mounted loosely thereon. The drum n^2 may be cylindrical; but the drum m^2 is not of uniform diameter. It may have one part, as m^4, of the same diameter as the drum n^2 and a second cylindrical part m^5 of smaller diameter, the two cylindrical parts being connected by a cone or fusee m^6, upon which the rope m may be wound.

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 most widely separated, so that the tendency of the ropes f and g, which pass over them, to rotate is overcome, the guides 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 guides 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 permitted to rotate together, paying out the ropes m and n to permit the guides 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, or rather is larger than that portion of the drum m^2 from which the rope m is then unwinding, whether such portion be the smaller cylindrical portion m^5 or the intermediate conical portion or fusee m^6, 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. Thereafter the two guides will move inward together at the same rate, as the rope m will then be unwinding from the larger cylindrical portion m^4 of the drum m^2, and therefore at the same rate as the rope n. By the time the two guides are close together the load will have reached its highest point, when the tendency to rotate is at its minimum and may be neglected. The closeness of the guides to each other, as will be understood, places the ropes f and g in the most desirable relations for the discharge of the load. When the movement of the winding mechanism is reversed and the guides are drawn outward on the cable by the ropes m and n, the guides will at first move together, and thereafter as the rope m passes from the cylindrical portion m^4 to the conical portion m^6 and thence to the smaller cylindrical portion m^5 of the drum m^2 the rope m will be taken up more slowly than the rope n, so that the guides will be separated as they are drawn out until the maximum separation is attained.

It will be understood that the invention may be applied to other structures and embodied in other forms than the structure and form shown in the drawings, and it is not to be limited to the particular construction and embodiment shown and described herein.

I claim as my invention—

1. In a hoisting apparatus, the combination of hoisting-ropes, separable guides for said ropes respectively and drums connected respectively to said guides to effect movement thereof, one of said drums having portions of different sizes whereby the rate of movement of one of said guides with respect to the other is varied during the movement of both guides.

2. In a hoisting apparatus, the combination of hoisting-ropes, separable guides for said ropes respectively, and drums connected respectively to said guides to effect movement thereof, one of said drums being cylindrical and the other of said drums having a portion of the same diameter as the first-named drum and another portion of different diameter, whereby said guides move at the same rate during a portion of their travel and at different rates during another portion of their travel.

3. In a hoisting apparatus, the combination of hoisting-ropes, separable trolleys having guide-sheaves for said ropes respectively, a support for the trolleys, and drums connected respectively to said trolleys to effect movement thereof, one of said drums having portions of different sizes whereby the rate of movement of one of said trolleys with respect to the other is varied during the movement of both trolleys.

4. In a hoisting apparatus, the combination of hoisting-ropes, separable trolleys having guide-sheaves for said ropes respectively, a support for the trolleys, and drums connected respectively to said trolleys to effect movement thereof, one of said drums being cylindrical and the other of said drums having a portion of the same diameter as the first-named drum and another portion of different diameter, whereby said trolleys move at the same rate during a portion of their travel and at different rates during another portion of their travel.

This specification signed and witnessed this 18th day of March, A. D. 1902.

CHARLES WALLACE HUNT.

In presence of—

C. C. KING,

W. B. GREELEY.