No. 729,869. PATENTED JUNE 2, 1903.

C. W. HUNT.

HOISTING APPARATUS.

APPLICATION FILED MAR. 28, 1902

NO MODEL. 2 SHEETS—SHEET 1.

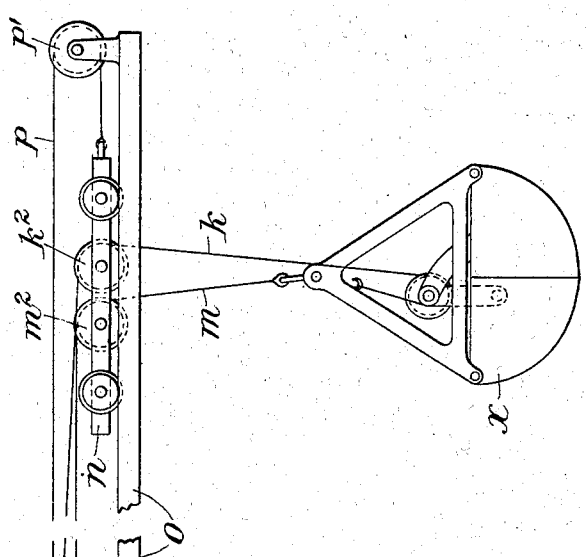
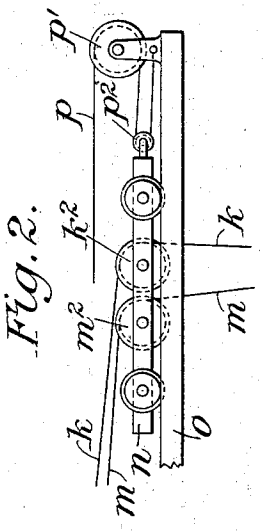


Fig. 2.



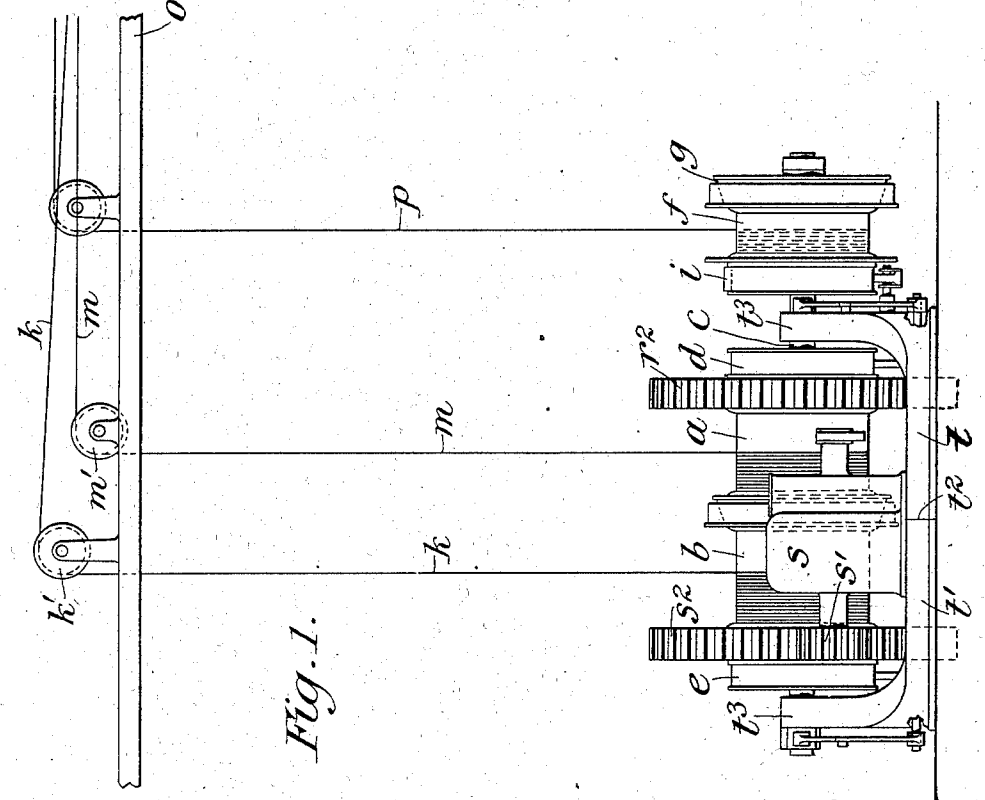


Fig. 1.

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No. 729,869. PATENTED JUNE 2, 1903.

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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 3.

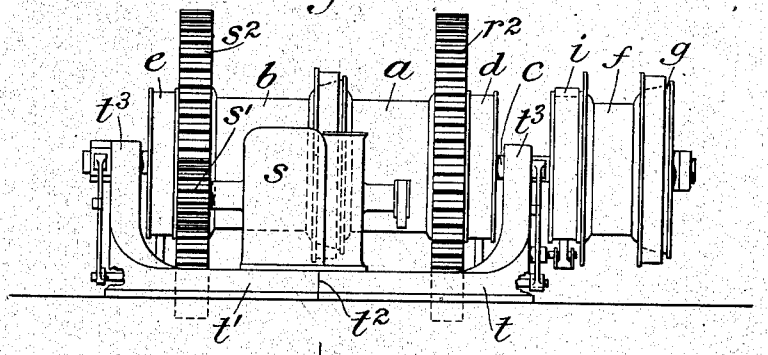


Fig. 4.

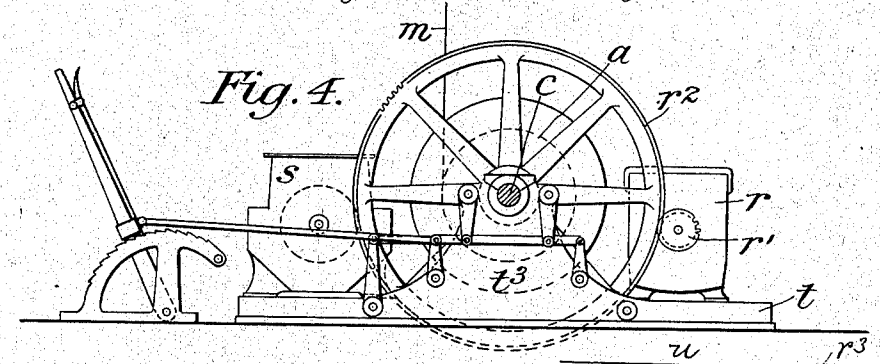


Fig. 6.

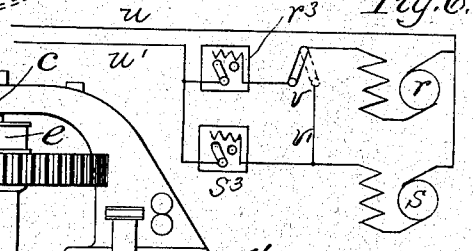


Fig. 5.

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No. 729,869. Patented June 2, 1903.

UNITED STATES PATENT OFFICE.

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

HOISTING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 729,869, dated June 2, 1903.

Application filed March 28, 1902. Serial No. 100,405. (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.

This invention relates to hoisting apparatus of the general character of that shown in Letters Patent of the United States numbered 622,366 and 624,811, in which two or more drums are connected to the load by ropes for the purpose of hoisting the same and of effecting its horizontal translation and in some cases for the purpose of opening and closing the shovel in which coal or other material is handled.

It is one object of this invention to make it possible to use electric motors for the operation of the hoisting apparatus and to realize all of the advantages in the use of such motors without the disadvantages of the previous methods in use. In accordance with the invention two motors are employed, the same being separately coupled to the drums to be driven and each being sufficient in size to perform all of the work which may be required of it, the several motors being further arranged to be coupled in such manner that they may share the maximum load which is put upon them.

A further object of the invention is to improve the construction of the hoisting machinery with especial reference to the convenient arrangement and combination in one structure of the motors and the winding-drums.

The invention will be more fully described hereinafter with reference to the accompanying drawings, in which for purposes of explanation it is represented as embodied in a suitable structure, and in which—

Figure 1 is a view, partly in elevation and partly in outline, of so much of a complete structure as is necessary to enable the invention to be understood, the hoisting apparatus being represented as having three drums. Fig. 2 is a detail view representing a modification in the connection of the haulage-rope to the trolley. Figs. 3, 4, and 5 are respectively a side view, an end view, and a plan view of the hoisting machinery, one of the drums being omitted in Fig. 4 and the shaft shown in section. Fig. 6 is a view representing diagrammatically suitable connections for coupling the motors electrically.

In the structure represented in the drawings two drums a and b for raising and lowering the load and for controlling the shovel, bucket, or skip x for the purpose of dumping the load when required are represented as mounted upon a common shaft c, the drum b being preferably fixed to the shaft to rotate therewith, while the drum a is preferably loose on the shaft. Each drum is also preferably provided with an independent brake, (marked d and e, respectively,) which may be controlled through suitable mechanism not necessary to be described herein. A third drum f for effecting the translation of the load in one direction or the other is arranged to be coupled mechanically to the drum b to rotate therewith when desired, and for this purpose may be loosely mounted on the shaft c and be coupled therewith by means of a clutch g, the fast member of which is fixed to the shaft c. The clutch may be operated by any suitable mechanism not necessary to be described. The drum f is also provided with a brake i, which may be controlled by any suitable means. A rope k, controlling the opening and closing of the shovel, bucket, or skip, is extended from the drum b over guide-sheaves k' and k^2, the latter being supported on the trolley n to the opening and closing devices on the shovel, which may be of ordinary construction. The hoisting-rope m, which is wound on the drum a in the same direction as the rope k on the drum b, passes over suitable guide-sheaves m' and m^2, the latter being mounted on the trolley-frame n, and is connected to the load in any suitable manner. The trolley n is arranged to travel, as usual, on a suitable track or support o, the haulage-rope p for effecting the translation of the load being wound on the drum f in the opposite direction from that in which the hoisting-rope m is wound on the drum a and extended thence over suitable guide-sheaves p' and p^2, one of these, p', being at the outer end of the trolley-support, and may

then be attached directly to the trolley-frame n, as shown in Fig. 1 or as shown in Fig. 2, the drum in the latter case being increased proportionately.

The construction and arrangement of parts thus far described may be as usual or as preferred, the present invention not being directly concerned with the details of its construction and arrangement. In accordance with the invention, however, an electric motor r is mechanically coupled to the drum a by suitable gearing, as indicated at r' r^2, and a second electric motor s is in like manner mechanically coupled to the drum b by suitable gearing, as indicated at s' s^2. The motor s is sufficiently large to operate the devices for controlling the opening and closing of the shovel or bucket under all conditions of use, but need not be large enough to perform effectively the entire work of raising the shovel with its load. The motor r likewise need not be of sufficient size to perform effectively the work of raising the shovel with its load; but in order that the power of both motors may be employed in the raising of the shovel with its load the connections are so arranged that each motor may be operated independently of the other when so desired and that both motors may be coupled for the raising of the load. The coupling of the motors to operate together is preferably effected electrically, the electrical connections being arranged in any suitable manner—as, for example, indicated diagrammatically in Fig. 6. As there represented, the motors r and s are connected in parallel with one side of the main line u u' through ordinary controlling devices r^3 and s^3 in the two branches, respectively, while in the branch between one of the controlling devices and the motor is included a switch v, adapted to open the branch and to make connection with the other branch through a wire v'. Thus when the switch v is in its normal position either motor may be used independently of the other, each motor being controlled independently through its own controlling devices. If it is desired to couple the motors electrically, as in parallel, when each motor will take its proper amount of current independent of the other motor, the switch v is thrown to the dotted-line position, thus cutting out one of the controlling devices, as r^3, and connecting both motors in parallel with one controlling device, as s^3, so that the two motors shall then be coupled electrically and under the control of a single device.

It will be understood, of course, that, as is usual in hoisting apparatus of the kind herein referred to, the two drums a and b are rotated together for the purpose of raising or lowering the load, it being a common practice to let the rope k, which operates the shovel-controlling devices, take the weight of the load, or a large portion thereof, the rope m being wound up at the same time to sustain the load when the rope k is slacked away to permit the opening of the shovel. In the use of the present invention, however, both ropes k and m are wound on their respective drums at the same rate and the load is borne by the two ropes, thus distributing the work of raising the load between the two motors in proportion to their relative power. For the translation of the load the drum f is coupled mechanically to the drum a, and the rope p being wound thereon in the opposite direction to that in which the rope m is wound on the drum a the stresses of the rope p and the two ropes k and m on their respective drums are statically in balance, with torsion on the drum-shaft. Under these conditions the only work to be performed in effecting the translation of the load is in overcoming the friction of the ropes, sheaves, and trolley, and this work is easily performed by one motor alone.

The several motors and drums are conveniently and advantageously supported, as shown in Figs. 3, 4, and 5, in which the base is shown as substantially symmetrical and formed in two parts t and t', the one of which is precisely like the other, so that the two can be cast from one pattern. Each part has a U-shaped bed-plate, with the ends of the limbs plane, as at t^2, to fit against the corresponding faces of the other part and to be securely joined thereto, and each has at the end of the yoke a pedestal t^3 to support the shaft c. The upper surfaces of the limbs of the bed-plate are also finished flat to provide suitable seats for the motors r and s, upon which they may be adjusted toward or from the shaft c, that the pinions r' s' may mesh properly with the gears r^2 and s^2 of the respective drums a and b. The brake and clutch controlling devices, which may be of any suitable character, may be supported upon the bed-plates or pedestals, as may be most convenient. As will be understood, by constructing the base and mounting the motors and drums thereon as described not only is the expense of construction reduced to a minimum, but the arrangement of the hoisting machinery thereby becomes very compact and convenient for operation.

I claim as my invention—

1. In a hoisting apparatus, the combination with a shovel, a hoisting drum and rope connected to the shovel, and a drum and rope for controlling the shovel, of electric motors separately connected mechanically to the several drums and arranged to be coupled electrically, substantially as described.

2. In a hoisting apparatus, the combination with a trolley, a support therefor, a shovel, a hoisting drum and rope connected to the shovel over the trolley, and a drum and rope carried over the trolley for opening and closing the shovel, of electric motors separately connected mechanically to the several drums and arranged to be coupled electrically, substantially as described.

3. In a hoisting apparatus, the combination

with a trolley, a support therefor, a shovel, a hoisting rope and drum connected to the shovel over the trolley, a drum and rope carried over the trolley for controlling the shovel, a drum and rope connected to the trolley for effecting translation of the load, and means to couple the last-named drum mechanically to the second-named drum, of electric motors separately connected mechanically to the first-named drum and the second-named drum and arranged to be coupled electrically, substantially as described.

4. In a hoisting apparatus, the combination of a motor, drum and rope to assist in hoisting the load, a second motor, drum and rope to assist in hoisting and to hold the load, a third drum and rope to effect translation of the load, means to couple the third drum to the second drum and means to couple said motors to operate together and to permit them to operate independently of each other, substantially as described.

5. In a hoisting apparatus, the combination with a motor, drum and rope to assist in hoisting the load, a second motor, drum and rope to assist in hoisting and to hold the load, a third drum and rope to effect translation of the load, means to couple the third drum to the second drum, said motors being arranged to be coupled electrically to operate together and to operate independently of each other, substantially as described.

This specification signed and witnessed this 8th day of February, A. D. 1902.

CHARLES WALLACE HUNT.

In presence of—

ANTHONY N. JESBERA,

M. A. BRAYLEY.