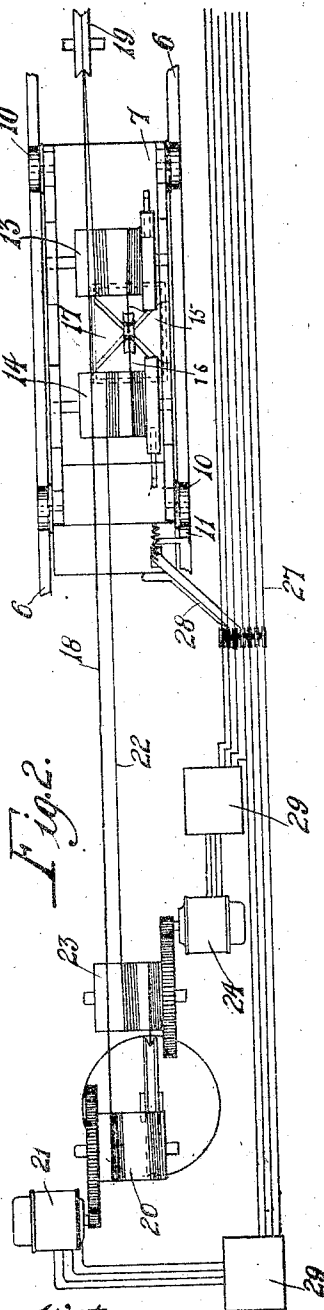


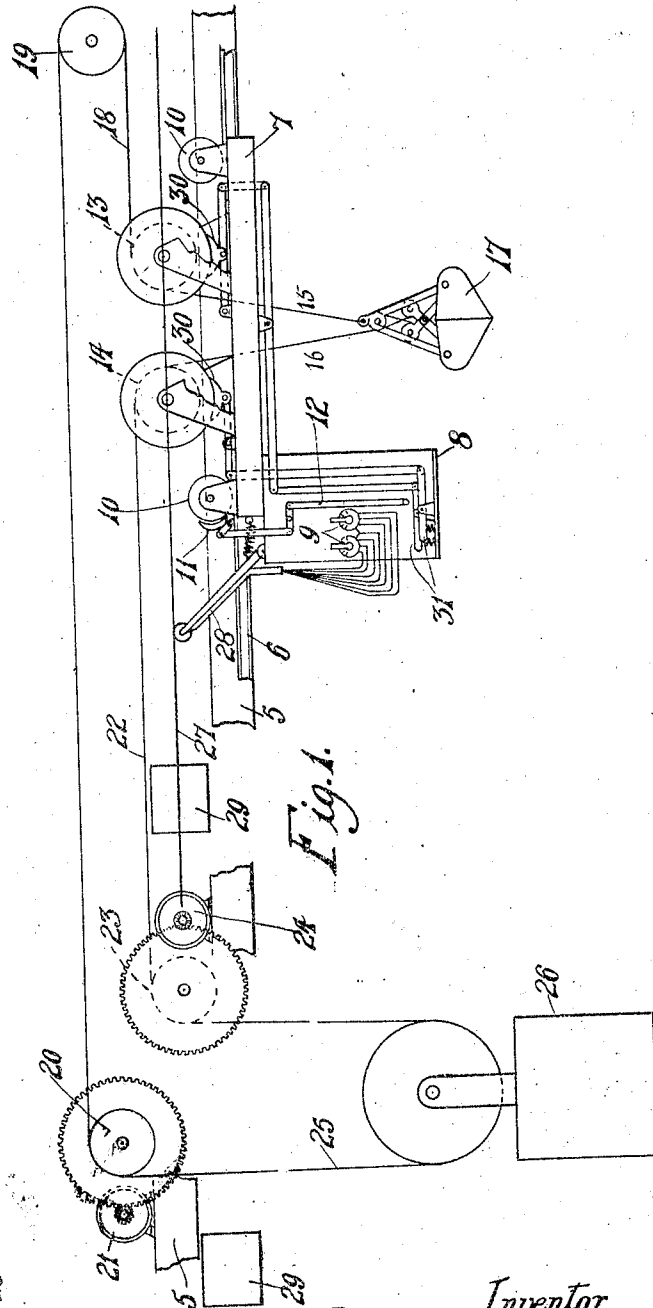
T. S. WATSON.
 APPARATUS FOR ELEVATING, TRANSPORTING, AND DISCHARGING MATERIAL.
 APPLICATION FILED MAR. 22, 1909.

Patented Oct. 4, 1910.

971,708.



Witnesses.
 A. Y. Andrews.
 Emma F. Schmidtbauer



Inventor
 Thomas S. Watson.
 By Benedict, Merrill & Caldwell.
 Attorneys

UNITED STATES PATENT OFFICE.

THOMAS S. WATSON, OF MILWAUKEE, WISCONSIN.

APPARATUS FOR ELEVATING, TRANSPORTING, AND DISCHARGING MATERIAL.

971,708.

Specification of Letters Patent.

Patented Oct. 4, 1910.

Application filed March 22, 1909. Serial No. 484,885.

To all whom it may concern:

Be it known that I, THOMAS S. WATSON, residing in Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented new and useful Improvements in Apparatus for Elevating, Transporting, and Discharging Material, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

This invention has relation to improvements in apparatus for elevating, transporting, and discharging material, and more particularly to that class of apparatus in which the power medium is located at a fixed point.

One of the objects of this invention is to provide a construction in which the power medium is located at a fixed point and is controlled by means carried on the traversing carriage.

A further object of this invention is to provide a construction in which the material holding receptacle is counterbalanced by means of a counterweight.

A still further object of this invention is to provide a construction whereby structures which are not provided with the modern means of operating the traversing carriages may be equipped with the improved means without materially strengthening the structure as the necessity for carrying the heavy motors or power means directly on the traversing carriage is obviated, although the controlling means and the operator are carried thereon.

A still further object of the invention is to provide a construction in which the material holding receptacle is counterbalanced by means of a counterweight suspended in a loop formed in a cable associated with both the hoisting cable and the receptacle opening and closing cable.

With the above, and other objects in view, the invention consists of the apparatus and its parts, and all equivalents thereof, as hereinafter more fully set forth.

In the accompanying drawings in which the same reference characters indicate the same parts in all of the views; Figure 1 is a side view of the complete apparatus, parts being shown diagrammatically; and, Fig. 2 is a plan view thereof, parts also being shown diagrammatically.

Referring to the drawing the numeral 5

indicates a fragment of the bridge which is supported on piers (not shown) which are adapted to travel on the rails of a track in the usual way. The bridge is provided with tracks 6 forming part of the bridge and upon which a carriage 7 is adapted to travel back and forth.

The carriage is provided with a cab 8 depending therefrom and containing electric motor controllers 9 for controlling the movement of the carriage and the operation of the material holding receptacle. The carriage is provided with wheels 10 which travel on the bridge track and a brake shoe 11 is adapted to engage one of the wheels to stop the carriage at any point desired. The brake shoe is operated by means of a lever and rod connection 12 positioned within the cab.

A hoisting drum 13 and a receptacle opening and closing drum 14 respectively are mounted on the carriage and are provided with ropes or cables 15 and 16 wound therearound and the depending ends thereof are connected, respectively, to the receptacle 17 and to the opening and closing mechanism of the receptacle. The other ends of the ropes or cables are made fast to the drums. A hoisting drum actuating cable 18 is wound on the hoisting drum 13 and extends therefrom in the direction of the time of travel of the carriage to and around a guide pulley 19 and thence in the opposite direction to and is wound around and fastened to a power drum 20 positioned on one end of the bridge. The drum is rotated by means of an electric motor 21 geared thereto.

A receptacle opening and closing drum actuating cable 22 is wound on the receptacle operating drum 14 and extends therefrom in the direction of the line of travel of the carriage and is wound around another power drum 23. This drum is geared to an electric motor 24 and is rotated thereby.

A cable 25, the ends of which are wound around the power drums, depends from the drums in the form of a loop in which is suspended the counterweight 26 which is adapted to exert a pull on both drum cables and counterbalance the receptacle.

The motors are controlled from the cab by the controllers 9, the connection therewith being made by means of the trolley wires 27 which extend in a line parallel with the line of travel of the carriage, and the

trolley pole 28, in electrical connection therewith, mounted on the carriage 7.

Magnetic controllers 29 are provided in the motor circuits which are adapted to be actuated by the small controllers 9 mounted in the cab in order to reduce the weight carried by the carriage to the minimum and also to avoid the necessity of providing trolley wires of large carrying capacity.

Both drums mounted on the carriage are provided with brakes 30 which are normally set or in the full on position. These brakes are shown in connection with foot operating levers 31 mounted within the cab, but it is obvious that they may be electro-magnetically operated by providing magnetic brakes in circuit with push buttons of ordinary construction, the push buttons being located within the cab.

The operation of the apparatus is as follows: Assuming that the parts are in the position shown in the drawings with both drum brakes set, the carriage will be caused to travel in either direction, depending on the direction of rotation of the motors, by supplying current to one of the motors and permitting the other one to run idle. The motor which is supplied with power will rotate the drum and pull the carriage in the direction the pulling cable extends from the carriage and the winding up of this cable on the power drum will permit the end of the looped cable wound on the same drum to unwind and the other end of this looped cable will be wound upon the other power drum which is running idle and paying out its cable to the carriage. During these movements the counterweight will remain in the same relative position, as the guide pulley to which the weight is connected will permit the free movement of the cable. If the power drum 20 has been operated to move the carriage to the right and the carriage has reached a position where it is desired to unload the bucket or receptacle, current is supplied to the motor which rotates the power drum 24 to slightly raise the counterweight and is shut off from the other motor. Simultaneously with these operations the brake controlling the travel of the carriage is set to stop the carriage and the brake in connection with the opening and closing drum and which is normally set, is released, thus permitting the weight of the bucket jaws to draw down on the opening and closing cable and open to discharge the contents of the receptacle. As soon as the bucket has discharged its contents the brake controlling the travel of the carriage is released and the brake controlling the opening and closing drum is set to hold the bucket in its open position and the direction of rotation of the motor 24 is reversed which will cause the carriage to move in the opposite direction, toward the left, and to the loading location.

As soon as the carriage has reached this point the carriage brake is set and the drum brakes released and the motors caused to rotate the power drums to raise the counterweight and pay out both cables leading to the bucket. This operation will permit the open bucket to drop by gravity into the coal or other material with which it is to be loaded. Current, which in the meantime has been shut off from both motors is turned on to the motor 24 to cause the drum geared thereto to wind up the opening and closing cable and close the jaws of the bucket on the coal or other material into which it dropped. When the jaws are closed and the bucket loaded the drum 20 is rotated to wind up the hoisting cable at the same rate of speed as the opening and closing cable is traveling so that the bucket will remain closed while being raised. While the bucket is being raised with its load the full effect of the counterweight is serving to counterbalance the bucket and its load so that but a minimum amount of power is required to lift the bucket. When the bucket has been raised a sufficient height the motors are stopped and the carriage drum brakes set and the carriage brake released and the power drum 20 is rotated to wind up the hoisting cable and move the carriage to the point of discharge as before described. While these different operations have been described step by step it is to be understood that many of the operations are performed simultaneously as it takes but a few seconds of time to load, travel and empty a bucket.

The construction of the apparatus is such that either power drum will move the carriage in both directions and the opening and closing of the jaws of the bucket may take place when the bucket is being raised or lowered or the carriage is traveling on the track.

While the drawing shows a plurality of cables connected to the drums and to the receptacle it is obvious that but a single cable may be used in lieu thereof and the same results obtained.

It will be seen from the foregoing description that the apparatus described is simple in construction and operation and is well adapted for the purposes described and the operator traveling with the carriage has direct supervision and control of all of the operations of the apparatus, and the carriage is not burdened with the weight of the motors and connected parts thereby permitting the use of the carriage in connection with, comparatively, a very light structure.

It is to be understood that this invention is not limited to any specific form or arrangement of parts except in so far as such limitations are specified in the claims.

What I claim as my invention is;

1. An apparatus for elevating, transporting, and discharging material, comprising a

track, a carriage provided with a material holding receptacle constructed to travel on the track, power means located at relatively a fixed point for causing the travel of the carriage on the track, a counterweight associated with the power means for counterbalancing the receptacle, and manually operated controlling means moving with the carriage for controlling the operation of the power means.

2. An apparatus for elevating, transporting, and discharging material, comprising a track, a carriage provided with a material holding receptacle constructed to travel on the track, power means located at relatively a fixed point for causing the travel of the carriage on the track and the operation of the receptacle, a counterweight associated with the power means for counterbalancing the receptacle, and manually operated controlling means moving with the carriage for controlling the operation of the power means to move the carriage and operate the receptacle.

3. An apparatus for elevating, transporting, and discharging material, comprising a track, a carriage provided with a material holding receptacle constructed to travel on the track, power means located at relatively a fixed point for causing the travel of the carriage on the track and the operation of the receptacle, a cable connection between the power means and the carriage for transmitting the power to the carriage, a counterweight associated with the cable for counterbalancing the receptacle, manually operated controlling means moving with the carriage for controlling the operation of the power means to move the carriage and operate the receptacle, and braking means for controlling the cable.

4. An apparatus for elevating, transporting, and discharging material, comprising a track, a carriage provided with a material holding receptacle constructed to travel on the track, power means located at relatively a fixed point for causing the travel of the carriage on the track and the operation of the receptacle, a cable connection between the power means and the carriage for transmitting the power to the carriage, a counterweight associated with said cable for counterbalancing the receptacle, and manually operated controlling means moving with the carriage for controlling the operation of the power means to move the carriage and operate the receptacle.

5. An apparatus for elevating, transporting, and discharging material, comprising a track, a carriage provided with a material holding receptacle constructed to travel on the track, a counterweight associated with said power means for counterbalancing the receptacle, power means located at relatively a fixed point for causing the travel of the

carriage on the track, and manually operated controlling means moving with the carriage for controlling the operation of the power means.

6. An apparatus for elevating, transporting, and discharging material, comprising a track, a carriage provided with a drum and a material holding receptacle constructed to travel on the track, power means located at relatively a fixed point, a cable connection between the power means and the carriage drum, a counterweight associated with said cable connection for counterbalancing the receptacle, and manually operated controlling means moving with the carriage for controlling the operation of the power means to move the carriage and operate the receptacle.

7. An apparatus for elevating, transporting, and discharging material, comprising a track, a carriage provided with drums and a material holding receptacle constructed to travel on said track, power means located at relatively a fixed point, a cable connection between the power means and the drums and the receptacle, a counterweight associated with said cable connection for counterbalancing the receptacle, and manually operated controlling means moving with the carriage for controlling the operation of the power means to move the carriage and operate the receptacle.

8. An apparatus for elevating, transporting, and discharging material, comprising a track, a carriage provided with drums and a material holding receptacle constructed to travel on said track, power means located at relatively a fixed point, a cable connection between the receptacle and one of the drums and the power means, another cable connection between the receptacle and the other drum and the power means, a counterweight associated with both cable connections to counterbalance the receptacle, and manually operated controlling means moving with the carriage for controlling the operation of the power means to move the carriage and operate the receptacle.

9. An apparatus for elevating, transporting, and discharging material, comprising a track, a carriage constructed to travel on said track, a hoisting drum mounted on the carriage, a receptacle opening and closing drum mounted on the carriage, an opening and closing receptacle suspended from said drums by a cable connection, power means located at relatively a fixed point, a cable connection between the power means and the hoisting drum, a cable connection between the power means and the receptacle opening and closing drum, a counterweight operatively associated with the last mentioned cables to counterbalance the receptacle, and manually operated controlling means moving with the receptacle for controlling the

independent rotation of the drums through the power means.

10. An apparatus for elevating, transporting, and discharging material, comprising a track, a carriage constructed to travel on said track, a hoisting drum mounted on the carriage, a receptacle opening and closing drum mounted on the carriage, an opening and closing receptacle suspended from said drums by a cable connection, power means located at relatively a fixed point, a cable connection between the power means and the hoisting drum, a cable connection between the power means and the receptacle opening and closing drum, a counterweight operatively associated with the last mentioned cables to counterbalance the receptacle, means moving with the carriage for retarding the rotation of the drums, and manually operated controlling means moving with the receptacle for controlling the independent rotation of the drums through the power means.

11. An apparatus for elevating, transporting, and discharging material, comprising a track, a carriage provided with a cab constructed to travel on said track, a hoisting drum mounted on the carriage, a receptacle opening and closing drum mounted on the carriage, an opening and closing receptacle suspended from said drums by a cable connection, power means located at relatively a fixed point, a cable connection between the power means and the hoisting drum, a cable connection between the power means and the receptacle opening and closing drum, a counterweight operatively associated with the last mentioned cables to counterbalance the receptacle, brakes operated from the cab for retarding the rotation of the drums, and manually operated controlling means moved with the carriage for controlling the independent rotation of the drums through the power means.

12. An apparatus for elevating, transporting, and discharging material, comprising a track, a carriage provided with a cab constructed to travel on said track, a hoisting drum mounted on the carriage, a receptacle opening and closing drum mounted on the carriage, an opening and closing receptacle suspended from said drums by a cable connection, electric motors located at relatively a fixed point, drums rotated by said motors, a cable connection between one of the motor drums and the hoisting drum, a cable connection between one of the motor drums and the receptacle opening and closing drum, a looped cable connected to both motor drums, a counterweight suspended in said loop to counterbalance the receptacle, brakes operated from the cab for retarding the rotation of the carriage drums, and manually operated controlling means moved with the carriage for controlling the independent rota-

tion of the motors and the operation of the carriage and receptacle.

13. An apparatus for elevating, transporting, and discharging material, comprising a track, a carriage provided with a cab constructed to travel on said track, a hoisting drum mounted on the carriage, a receptacle opening and closing drum mounted on the carriage, an opening and closing receptacle suspended from said drums by a cable connection, electric motors located at relatively a fixed point, drums rotated by said motors, a cable connection between one of the motor drums and the hoisting drum, a cable connection between one of the motor drums and the receptacle opening and closing drum, a looped cable connected to both motor drums, a counterweight suspended in said loop to counterbalance the receptacle, brakes operated from the cab for retarding the rotation of the carriage drums, a brake operated from the cab for retarding the travel of the carriage, and manually operated controlling means moved with the carriage for controlling the independent rotation of the motors and the operation of the carriage and receptacle.

14. An apparatus for elevating, transporting, and discharging material, comprising a track, a carriage provided with a cab constructed to travel on said track, a hoisting drum mounted on the carriage, a receptacle opening and closing drum mounted on the carriage, an opening and closing receptacle suspended from said drums by a cable connection, electric motors located at relatively a fixed point, drums rotated by said motors, a cable connection between one of the motor drums and the hoisting drum, a cable connection between one of the motor drums and the receptacle opening and closing drum, a looped cable connected to both motor drums, a counterweight suspended in said loop to counterbalance the receptacle, brakes normally set and operated from the cab for retarding the rotation of the carriage drums, a brake operated from the cab for retarding the travel of the carriage, and manually operated controlling means moved with the carriage for controlling the independent rotation of the motors and the operation of the carriage and receptacle.

15. An apparatus for elevating, transporting and discharging material, comprising a track, a carriage provided with a material holding receptacle constructed to travel on the track, power means located at relatively a fixed point for causing the travel of the carriage on the track and the operation of the receptacle, a cable connection between the power means and the carriage for transmitting the power to the carriage, a counterweight associated with the cable for counterbalancing the receptacle, and manually operated controlling

means for controlling the operation of the power means to move the carriage and operate the receptacle.

16. An apparatus for elevating, transporting, and discharging material, comprising a track, a carriage provided with a cab constructed to travel on said track, a hoisting drum mounted on the carriage, a receptacle opening and closing drum mounted on the carriage, an opening and closing receptacle suspended from said drums by a cable connection, electric motors located at relatively a fixed point, drums rotated by said motors, a cable connection between one of the motor drums and the hoisting drum, a cable connection between one of the motor drums and the receptacle opening and closing drum, a looped cable connected to both motor drums, brakes operated from the cab for retarding the rotation of the carriage drums, and manually operated controlling means moved with the carriage for controlling the independent rotation of the motors and the operation of the carriage and receptacle.
17. An apparatus for elevating, transporting, and discharging material, comprising a track, a carriage provided with a cab

constructed to travel on said track, a hoisting drum mounted on the carriage, a receptacle opening and closing drum mounted on the carriage, an opening and closing receptacle suspended from said drums by a cable connection, electric motors located at relatively a fixed point, drums rotated by said motors, a cable connection between one of the motor drums and the hoisting drum, a cable connection between one of the motor drums and the receptacle opening and closing drum, a looped cable connected to both motor drums, brakes normally set and operated from the cab for retarding the rotation of the carriage drums, a brake operated from the cab for retarding the travel of the carriage, and manually operated controlling means moved with the carriage for controlling the independent rotation of the motors and the operation of the carriage and receptacle.

In testimony whereof, I affix my signature, in presence of two witnesses.

THOMAS S. WATSON.

Witnesses:

C. H. KEENEY,
ALMA A. KLUG.