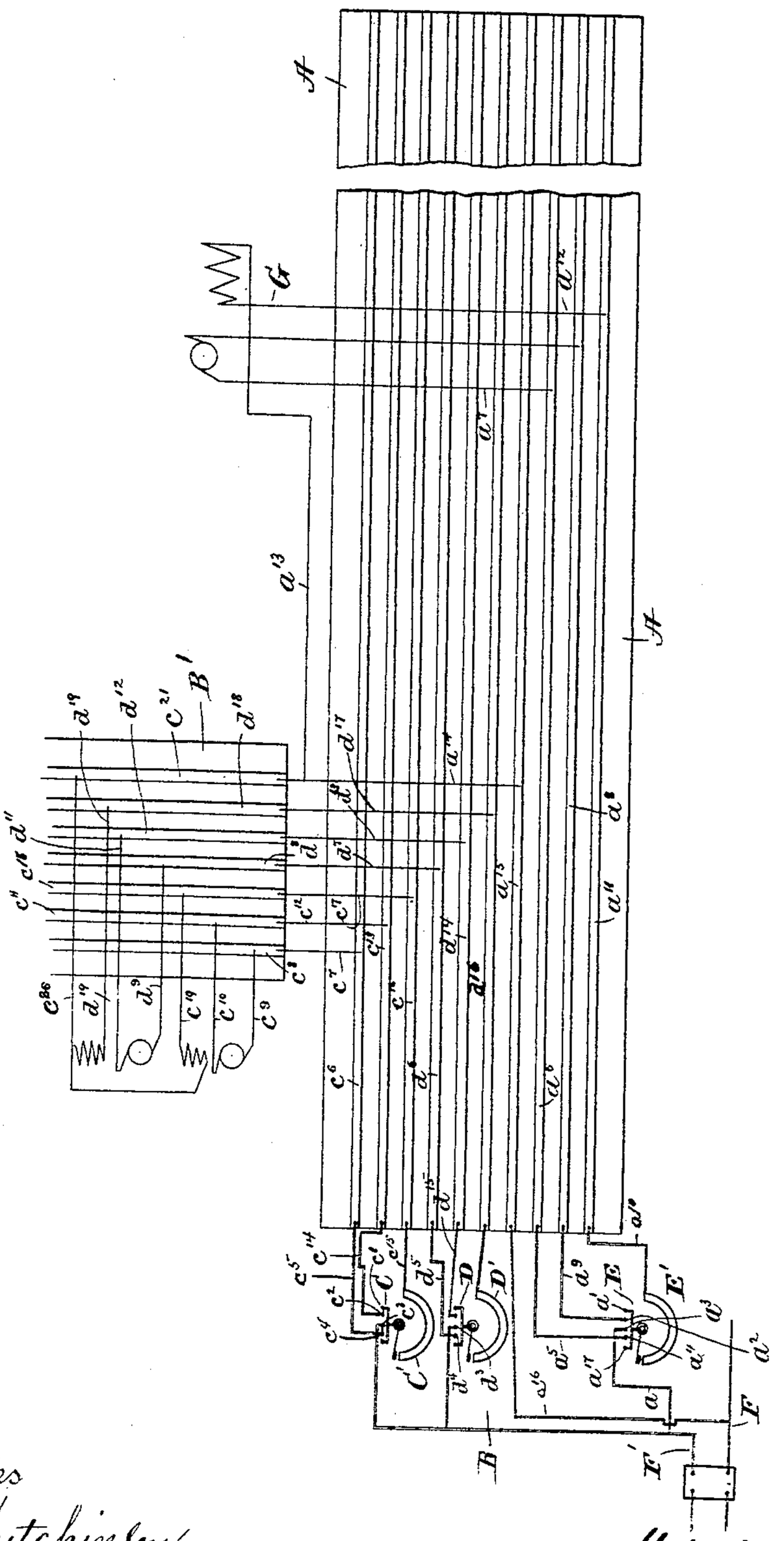
(No Model.)

W. H. MORGAN.

ELECTRIC TRAVELING CRANE.

No. 496,945. Patented May 9, 1893.



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ELECTRIC TRAVELING CRANE.

SPECIFICATION forming part of Letters Patent No. 496,945, dated May 9, 1893.

Application filed June 13, 1892. Serial No. 436,565. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM HENRY MORGAN, of Alliance, in the county of Stark and State of Ohio, have invented certain new and useful Improvements in Overhead Traveling Cranes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement in overhead traveling cranes.

In the overhead traveling cranes now in use and particularly those actuated by electric motors, the movements of the bridge, and the trolley on the bridge, are controlled by an operator located within a cage suspended from the bridge near one end thereof. This cage contains levers and devices for actuating the switches and rheostats and the currents are ordinarily taken to and from the motors on the bridge through copper strips located on a support adjacent to one of the overhead track ways on which the bridge supporting carriages are mounted. With this arrangement of parts the travel of the crane, the cross travel of the trolley and the movements of the hoisting devices are all under control of the operator in the cage. In some instances it is not necessary to keep an attendant constantly in the cage, and even where the attendant is kept constantly in the cage, it is sometimes difficult to attract his attention when the crane is needed at the far end of the shop.

The object of my present invention is to provide means whereby the travel of the crane and the movement of the trolley and parts carried thereby can be controlled from a point of observation in the shop or at intervals about the shop, and it consists in parts and combinations of parts as will be more fully described and pointed out in the claims.

The accompanying drawing is a diagrammatic view representing my invention.

The electrically operated cranes are as a rule mounted on elevated trackways, the bridge or crane carrying a series of contacts moving in contact with a series of copper strips located under one of the overhead trackways. These contacts are connected by wires, copper strips or other conducting medium, to copper strips or wires running lengthwise the bridge, which latter supplies a current as the case may be to the motor or motors carried by the trolley, through the intervention of sliding contacts carried by the trolley.

The construction of the bridge and trolley, is unimportant as my invention consists solely in means for supplying currents to the motor on the bridge and motor or motors on the trolley. Hence a diagrammatic representation of the conductors located alongside of one of the bridge supporting trackways, and the conductors located on the bridge, together with a representation of one set of switches and rheostats for opening, closing and regulating the circuits, will be sufficient to enable the invention to be understood.

In the drawing A represents a series of conductors, preferably copper strips, located on a suitable support adjacent to one rail of the overhead trackway supporting this crane, and in a position to be engaged by contacts carried by the bridge.

B represents a stationary pulpit or stand, containing a reversing switch, and rheostat for each motor on the bridge and trolley, and while I have only shown one pulpit or stand it is evident that more can be employed and can be located at intervals throughout the shop so that the crane and the parts thereon can be operated by one located at a distance from the same. On the pulpit or stand, are located the reversing switch C and rheostat C′ for the motor which propels the trolley backward and forward on the bridge, the reversing switch D and rheostat D′ for the hoist motor carried by the trolley, and the reversing switch E and rheostat E′ for the motor which actuates the bridge.

The motor which actuates the bridge, is fixed on the bridge, and hence receives the current directly from the copper strips A, and not through the strips B′, as the latter simply convey current to and from the motors carried on the trolley which as before stated is movably mounted on the bridge.

F F′ represent the main conductors the latter having connections leading to the several switches and rheostats.

G is a diagrammatic representation of the motor on the bridge for propelling the bridge. This motor G is supplied with current from the main conductor F′ through the branch *a*

leading to switch E. For the purposes of illustration I will suppose that the contacts a' and a^2 of the switch E and the contacts a^3 and a^4 are coupled up. The current entering branch a will pass from a^3 to a^4 and thence through branch a^5 to the copper strip a^6. From strip a^6 it will pass through the contact at end of conductor a^7, through latter to commutator brushes and commutator to copper strip a^8; through the latter to conductor a^9 which latter leads to contact a^2 of the switch E. From contact a^2 it passes to contact a' through the rheostat E′ to conductor a^{10} and from latter to copper strip a^{11} which latter is connected by a sliding contact and conductor a^{12} with the field of motor G. From the field the current passes through conductor a^{13} to the common return a^{14} which latter is connected to strip a^{15}, the latter being connected at its end to the main conductor F through branch a^{16}. By this arrangement I secure motion of the armature in one direction and to secure a reversal of movement of said armature and consequently a reversal of the direction of movement of the bridge it is simply necessary to couple up a^{17} with a^4, and a^3 with a^2.

The traveling bridge, carries a board or other support having thereon a series of strips B′ each of which latter is provided with a contact adapted to move on or against one of the copper strips A. The trolley on the bridge is not stationary and as the motors for propelling the trolley and rotating the hoisting drum are on the movable trolley it is evident that the conductors leading to and from the several motors on the trolley must have a sliding connection with the strips carried by the bridge. From the foregoing it will be seen that all the motors receive their currents through sliding contacts engaging the copper strips A, while the motors on the trolley are supplied through the medium of the strips A, sliding contacts and conductors leading to strips B′, and sliding contacts and conductors leading from strips B′ to the several motors on the trolley.

The switch and rheostat C′ are for supplying and regulating the current to the motor which propels the trolley. The current as in the preceding enters through the main line F′ and passes directly to the switch C. If the contacts c' and c^2, and c^3 and c^4 are coupled up, the current will pass from c^3 to c^4 through branch c^5 to strip c^6, and from latter through sliding contact and conductor c^7 to copper strip c^8 on the bridge. From thence it is taken by sliding contact and conductor c^9 through commutator and brushes, conductor and sliding contact c^{10} to copper strip c^{11} and from thence through conductor and sliding contact c^{12} to strip c^{13} of the part A which as before stated is secured in position adjacent to one rail or track on which the bridge travels. The current then passes from strip c^{13} through branch c^{14}, through the contacts c^2 and c' to the rheostat C′, from thence through branch c^{15} to strip c^{16}, to sliding contact and conductor c^{17} to strip c^{18}, to sliding contact and conductor c^{19} through the field to conductor and sliding contact c^{20}, to strip c^{21} and from thence to the common return a^{14} which as before stated has sliding contact with the strip a^{15}.

To reverse the direction of the current through the motor and consequently change the direction of travel of the trolley, the current from the main conductor F′ instead of passing first through branch c^5 to strip c^6, passes through branch c^{14} and strip c^{13} and returns by the way of strip c^6 and branch c^5.

The mechanism for actuating the hoist motor, carried by the trolley consists of the switch D and rheostat D′. The current enters from main conductor F′, and passes from contact d^3 to contact d^4 thence through branch d^5 to strip d^6, to sliding contact and conductor d^7 to strip d^8 on part B′. From thence it passes by means of sliding contact and conductor d^9 to commutator and from thence through conductor and sliding contact d^{11} to strip d^{12}, through conductor and sliding contact d^{13} to strip d^{14} through branch d^{15}, switch D and rheostat D′ to strip d^{16}, to sliding contact and conductor d^{17} to strip d^{18} on part B′. From thence it passes through sliding contact and conductor d^{19} to the field and from the field to the conductor and sliding contact c^{20} to strip c^{21} and from thence to the common return a^{14}, (which is simply a conductor and sliding contact) to the common return strip a^{15} and from thence out through main conductor F. To reverse the current and consequently change the direction of rotation of the hoisting drum it is simply necessary to switch the current through the branch d^{15} and have it returned through branch d^5.

While with the arrangement I have described the cage ordinarily carried by the bridge can be dispensed with, nevertheless it is not essential that it should be dispensed with as the pulpits or stands carrying the switches and rheostats can be employed in addition thereto, and can be located at one or more convenient places about the shop, so that the movements of the bridge and the parts carried thereby can be controlled from the floor of the shop.

It is possible to use motors of different wiring which would mean a different arrangement from the one represented. However the main feature is to have the operator located at some stationary point, while the different motions of the crane are in operation.

It is evident that numerous slight changes and alterations might be resorted to without departing from the spirit and scope of my invention. Hence I would have it understood that I do not confine myself to the exact construction and arrangement of parts herein shown and described, but,

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. Apparatus for controlling the movements

of overhead traveling cranes from the floor or other convenient point in the shop, consisting essentially in a stationary stand or pulpit having a switch and rheostat operating device therein, stationary conductors in circuit with the rheostat and switch, a motor on the traveling bridge and conductors and sliding contacts connecting the field magnets and brushes of the motor with said stationary conductors, substantially as set forth.

2. The combination of a stationary stand or pulpit having a switch and rheostat operating devices thereon, a series of stationary conductors in circuit with the rheostat and switch, a motor mounted on a traveling bridge, and conductors and sliding contacts connecting the field magnets and brushes of the motor with said stationary conductor, substantially as set forth.

3. The combination with a stationary operating stand or pulpit having a switch and rheostat operating devices therein, for each motor circuit, a main conductor, a motor circuit leading from each switch and rheostat, and sliding contacts and conductors for each motor, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

WILLIAM HENRY MORGAN.

Witnesses:
F. E. DUSSE,
H. W. HARRIS.