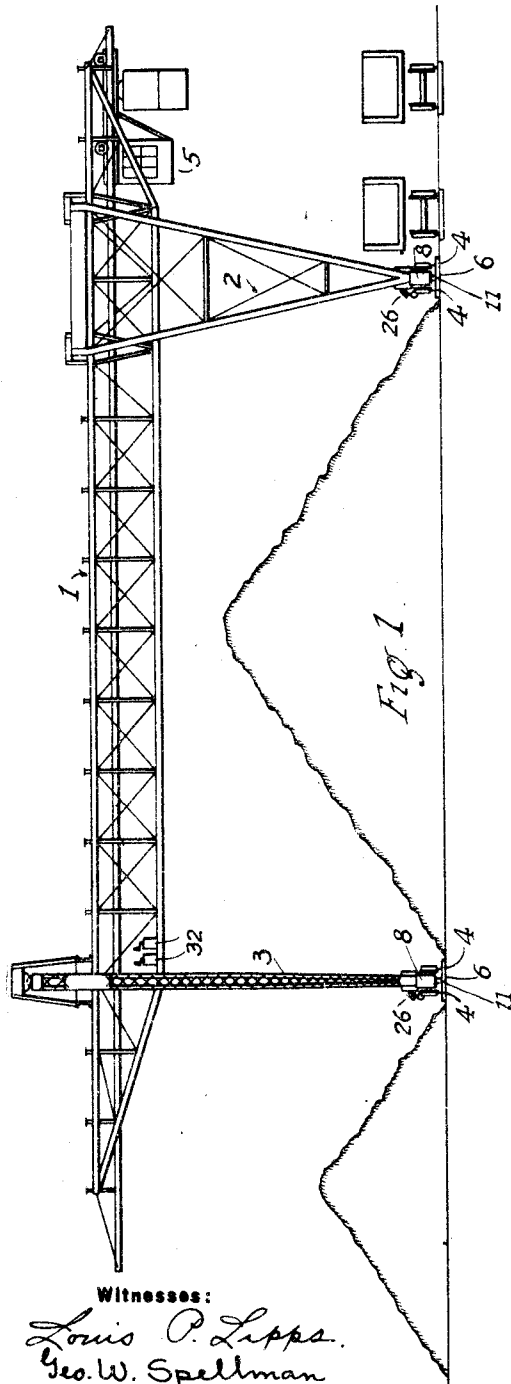


W. K. MONROE.
 MEANS FOR LOCKING TRAVELING CRANES.
 APPLICATION FILED DEC. 2, 1912.

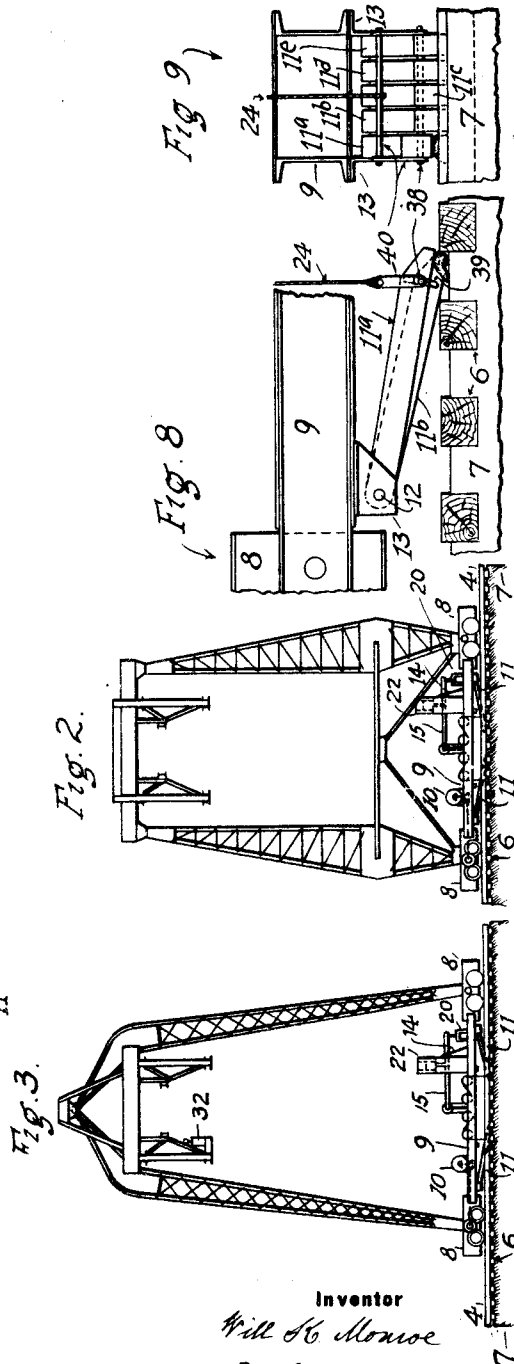
1,064,519.

Patented June 10, 1913.

3 SHEETS—SHEET 1.



Witnesses:
 Louis P. Lipps.
 Geo. W. Spellman



Inventor
 Will K. Monroe
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 His Attorney

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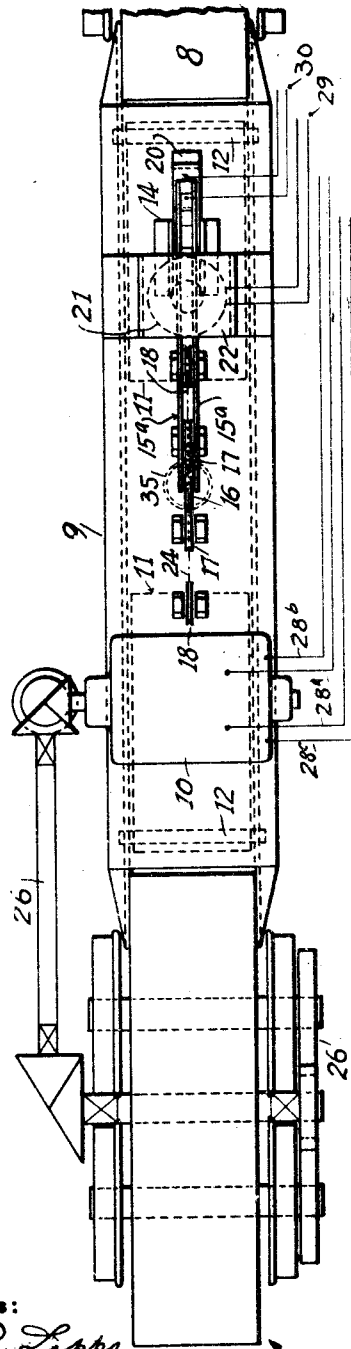


Fig. 5

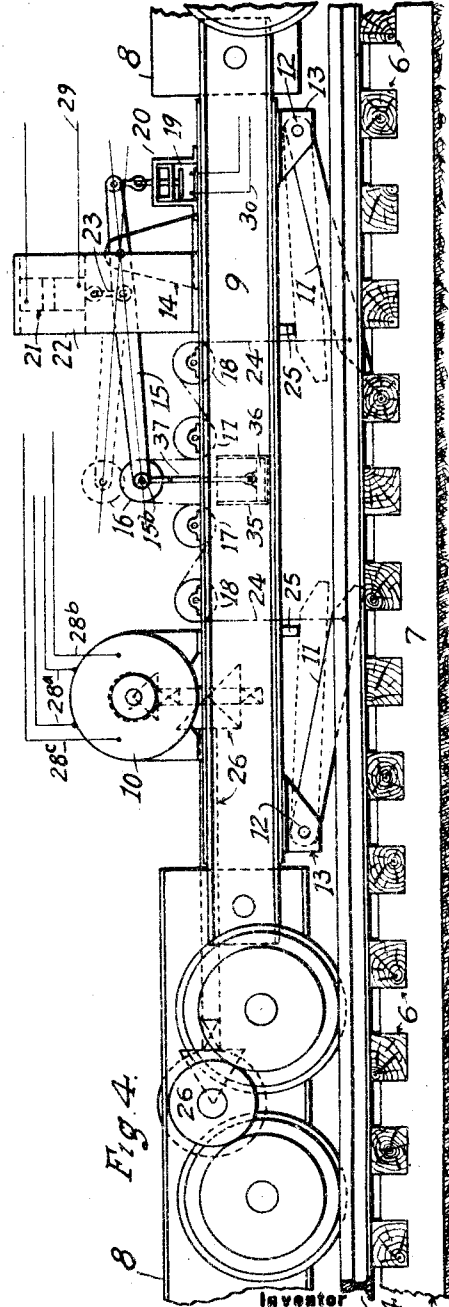


Fig. 4

Witnesses:
Louis P. Lippe
Geo. W. Spellman

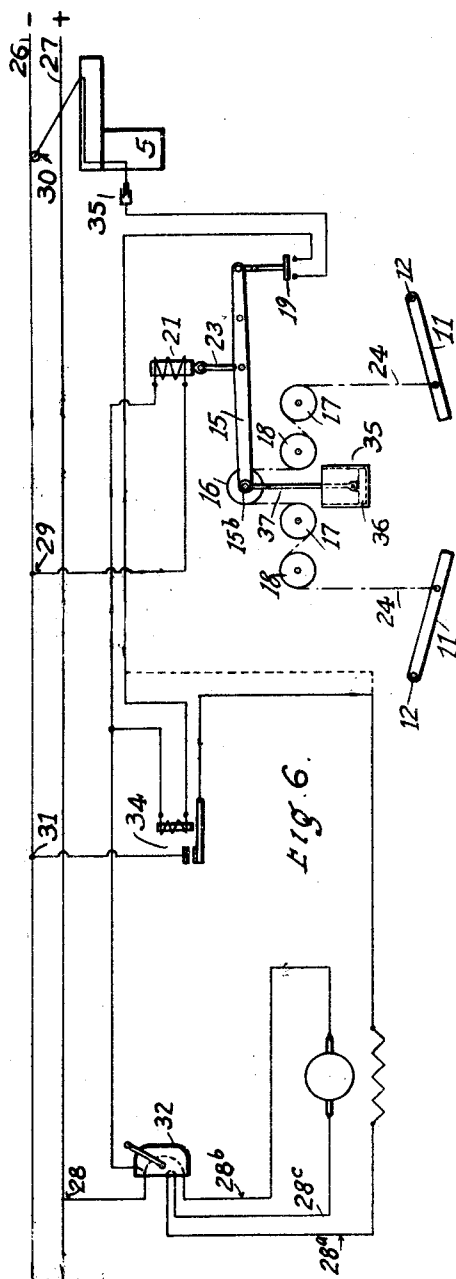
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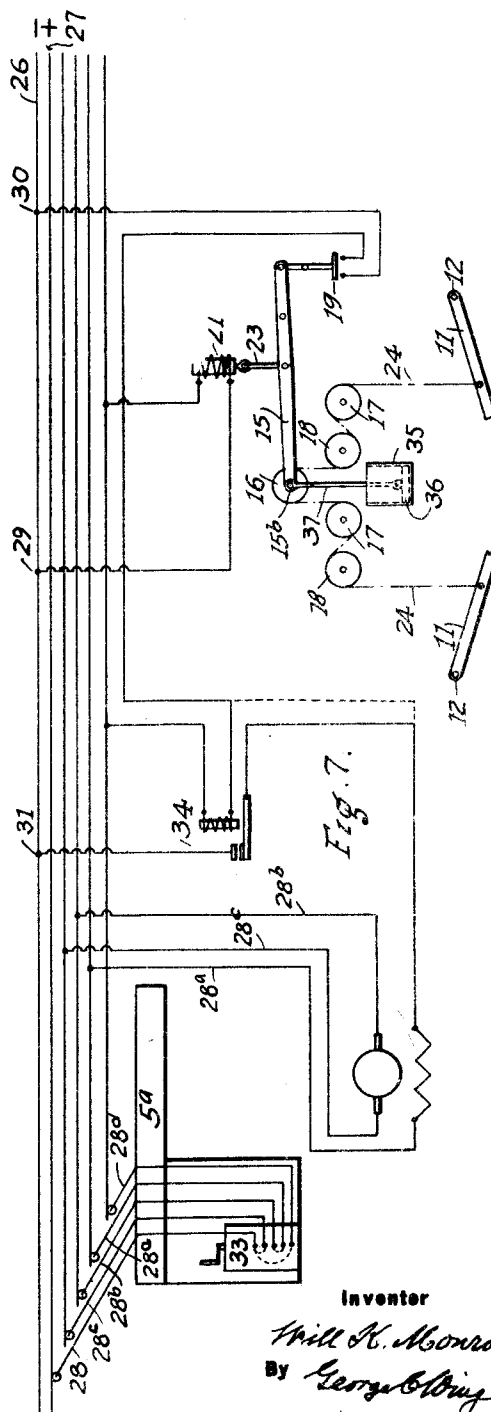
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

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MEANS FOR LOCKING TRAVELING CRANES.

1,064,519.

Specification of Letters Patent.

Patented June 10, 1913.

Application filed December 2, 1912. Serial No. 734,565.

To all whom it may concern:

Be it known that I, WILL K. MONROE, a citizen of the United States, residing in the city of Cleveland, county of Cuyahoga, and State of Ohio, have invented a new and useful Means for Locking Traveling Cranes, of which a clear and exact description, with references therein to drawings that accompany and make a part of the specifications, is hereinafter fully set forth.

Broadly considered, the device is applicable to any structure that is movable on rails or along a firm course, but, in practice, its widest adaptation will be in connection with constructions of the overhead crane type as the same are employed on docks, or in the yards of shops, for the handling of ore, coal and structural material of various sorts. In such cases the crane proper, or tramway portion, is supported in a horizontal position above the field for operation by piers and shear-legs at the respective ends which latter are movably mounted on rails that extend to the predetermined distance for its travel. Under these conditions, and by reason of the weight and superficial dimensions involved, the structure is liable, at times, to a sudden motive impulse from wind-pressure, sufficient to overcome any ordinary resisting appliances that are used. Nevertheless, aside from obtaining the most effective locking applicable to the situation, it is highly important to both life and property that the means employed shall not depend upon the summoning of special help, on each occasion, but may be effected, and the locking be made or unmade, instantaneously, by the operator himself whenever, from his look-out point on the crane, he realizes the need.

In the drawings Figure 1 is a side elevation of a crane supported by the customary pier and shear, and provided with the device in question. Fig. 2 is an end view of the pier end of the same. Fig. 3, an end view of the shear end. Fig. 4 is an enlarged fragmentary elevation of the foot of said pier or shear, and of the operative parts and mechanisms belonging to the invention. Fig. 5 is a plan of Fig. 4. Fig. 6 is a plan of electric wiring applicable. Fig. 7 is another plan of such a wiring. Fig. 8 illustrates a form of the device, when a series

of a single member or piece, and, Fig. 9 is an end view of Fig. 8.

1 is a traveling crane supported, at one end, by the pier 2 and, at the other, by the shear 3, the supports themselves being carried by trucks 8, 8, that are adapted to travel on the rails 4, 4.

5 and 5^a denote man-trolleys traversibly mounted on the bridge itself.

In the drawings the rails 4 are laid upon and supported by a series of parallel ties 6 which are shown as firmly seated in a bed 7, and, in such position, as projecting somewhat above the upper surface of the bed.

The trucks 8, 8, at each end of the bridges, are joined together by sills 9, 9, which serve as the necessary supporting frame-work or base for a crane-traversing motor 10, pawl-like parts or tongue-pieces 11, and a solenoid apparatus for operating the same to be hereinafter more fully explained.

The pawl-like parts 11, in Figs. 4 and 5, are represented as single, oppositely related pieces, medially connected to the sills 9 by brackets 13 fastened to the undersides of the sills near their ends. Said pieces are joined to the brackets by the pivots 12 that pass through the brackets and pieces along their upper end or side. In this manner said pieces are free, under normal conditions, to turn on their pivots downwardly and engage any predetermined obstacle in the path of their forward travel and stop further movement of the crane in that direction. Inasmuch as the downward movement of said pieces may be prematurely checked by some point of the same coming into contact with a chance obstacle or irregularity, like a lump of coal, or ice, and the desired locking engagement thereby be prevented, instead of producing this feature in the form of a single piece, as in Figs. 4 and 5, it may be made up of several separate and distinct parts or bar-like pieces 11^a, 11^b, appearing in Fig. 8, and 11^a, 11^b, 11^c, 11^d and 11^e, as shown in Fig. 9. In this form a sufficient freedom of action is permitted the several members of the series by threading them together upon a rod 38 that passes through a transverse slot 39 in the same near the forward end of each piece. Said pawl-like pieces should be of such length that when the free ends are at the lowest or normal point of the allowed movement, the pieces

themselves will be dependent from the sills at an acute angle with the horizontal.

At any convenient point on the sills 9 a rigid standard 14 is located to serve as a fulcrum for an oscillating lever 15 which is suitably pivoted to the same. The lever 15 is shown as made up of two parallel bars 15^a united together with space between the same to permit a sheave 16 to be mounted therein at the end on an axle 15^b.

A series of sheaves 17, 18, are arranged upon the sill below and to the right and left of the sheave 16, and in alinement with the free ends of the oppositely related pawl-like pieces 11. From the other arm of the lever 15 a switch-plate or contact piece 19 is flexibly suspended within a guide 20 on the upper side of the sills 9 provided for the purpose. Intermediately of the fulcrum point of the lever 15 and the sheave 16, above and around said lever, a standard 22 projects from the sills for the purpose of supporting a solenoid, indicated by 21, which is connected to the lever beneath by a link 23. The latter should be of suitable length to allow the lever-arm to which it is connected to descend, when the solenoid is deenergized, far enough to correspondingly raise the other arm to a sufficient distance to carry the pendent switch-plate 19 out of contact.

A rope is reeved around the sheave and extends downwardly on each side thereof under sheaves 17 to and around sheaves 18, in both directions, downwardly to the free ends of the pieces 11, to which the rope is fastened. When the pieces 11 are single, as in Figs. 4 and 5, the rope may be fastened to the piece directly as these indicated, but when the piece is made up of a series of members, as in Figs. 8 and 9, the connection may be indirect, as through a bail 40, that engages the ends of the rod 38. However the connection is made, the rope should be of the proper length to fill the several leads specified when the solenoid 22, being deenergized, the lever 15 and the ends of the pieces 11, are in their normal attitudes. Stops 25 are located on the under side of the sills to limit the upward movement of the tongue-pieces 11.

A motor is shown at 10, for actuating the trucks 8 upon the rails and thereby traversing the crane above the same. Its operative coupling for the purpose, by gears and shafting to one of such trucks, is indicated by 26.

In order to delay or prolong the descent of the lever-arm, and the pawl-parts or pieces 11 when the current is shut off from the motor and solenoid circuits, until the crane travel has come to a stop, I interpose a dash-pot 35 beneath the lever-arm referred to, with its dasher 36 connected to said lever by the rod 37.

The electric wiring required for the operation of said device, as planned, is shown in

two systems; that in Fig. 6 being adapted to the conditions when the controller or controllers employed are stationary with respect to the man-trolley, and, the other, in Fig. 7, when the controllers are located within the trolley itself. In these figures, the main wires or circuits are denoted in Figs. 6 by 26 and 27, and the subordinate wires or circuits by 28—29, 28—30, and 28—28^a—28^b—28^c—31, the latter circuit being provided with a solenoid-switch 34, the alternative circuit, including the dotted line, 28, 28^b, 28^c, 28^a—30, and the circuit 28—30 being provided with a plug-switch 35. In Fig. 7 the subordinate circuit 28—28^a—28^b—28^c—31, corresponds with 28—28^a—28^b—28^c—31 in Fig. 6, and 28—28^a—28^b—28^c—30 is an alternative circuit dispensing with the solenoid 24. The circuit 28—28^a—30, in this form, is constant the controller being always in the trolley, and of course, without need of a special plug connection as in the previous form.

The controllers are indicated by 32 and 33.

A crane or similar construction provided with electrically controlled and operated tongue-pieces 11, in the manner described, will manifestly be entirely protected against unexpected movement at all times when the current governing the movement of the crane itself is turned off. Under such condition, inasmuch as the circuits that actuate the mechanism to raise the pawls or tongue-pieces 11, are subordinate to and dependent upon the circuit that actuates the crane motor, when the crane itself has come to a stand-still, said oppositely related pieces must become free to fall into position for an immediate engagement at their forward ends with a tie, or other fixed stop or obstacle for the purpose.

Any wind-force tending to move the crane in the direction of either of said pieces will of course then be effectually resisted by such engagement. When the machine is without power, during nights or other regular periods of idleness, its permanent or normal condition will also be a locked condition, while during working hours, the locking or unlocking can never occur without the knowledge and positive act to that end by the operator himself. This, because the pawls can only be lifted from their engagement with the ties 6, by energizing the solenoid 21 and, this can only be effected, in Fig. 6, by the operator deliberately bringing his trolley up to the stationary controllers 32, and inserting the plug for the switch 35. Thereupon, and not before, if the controller handle is moved, the circuit 28—29 will be completed, the solenoid 21 energized, which will raise the lever-arm of the lever 15, and the pawls 22 connected therewith.

In the meantime, the other arm of said lever will descend until the contact-piece 19

5 closes the circuit 28—30, which closure will energize the solenoid-switch 34, close the circuit switch at that point and thereby energize the crane-motor 10. The crane will thus be started along the rails, but, inasmuch as the lever arms by which the necessary contact for the purpose is made, are so proportioned that a sufficient downward movement of the arm carrying the contact-piece 19, to close the circuit 28—30, cannot take place until a corresponding upward movement of the other arm has occurred that has sufficed to raise the pawl or tongue-pieces 11 entirely clear of their engagements with the ties 6, no premature starting of the crane can occur.

10 In the reverse operation of bringing the crane to a stop, the controller handle must, of course, be moved back to zero, with the result, in either of the forms or systems disclosed, that the motor and the solenoids throughout the system will be deenergized, and the pawls allowed to fall into their destined locking engagements by their own weight. To guard against the latter action of said pawls occurring before the momentum of the crane is exhausted and its movement along the rails has ceased, the dash-pot arrangement, 35, 36 and 37 is provided to retard the fall of the lever-arm connected with said pawls until the possibility of their forward ends encountering the ties while the crane is moving has passed.

15 Of course there are details in the apparatus just described that may be varied or changed without departing from the invention as it is intended to be claimed. Such, for instance, is the tongue-piece 11 which is equally considered as within the meaning of the claims whether single in construction, made up in a series of bars, or pieces, as specified, or in other form; so too, any other form than railroad ties may be used for the stops when directly in the line of travel, and, indeed a construction is admissible where the pawls might oscillate laterally of the rails and the stops be arranged accordingly.

20 Having thus described my said invention as embodied in a concrete mechanism, what I claim as new and wish to protect by Letters Patent is:—

1. A means for locking traveling cranes and similar constructions, comprising the combination with a tongue-piece pivotally connected to the same, of a series of stops for said piece located exteriorly of the crane within the lowest range of the oscillation of the piece around said pivotal connection, together with electrically controlled means for oscillating said piece upwardly around said connection to a position clear of said stops, substantially as shown and described.

2. A means for locking traveling cranes

and similar constructions, comprising the combination of oppositely related tongue-pieces pivotally attached to the same, a solenoid on said crane, a lever suitably connected to the solenoid to be actuated thereby when said solenoid is energized, and, to the tongue-pieces to oscillate the same around their pivotal connections to the crane when actuated, as aforesaid, and an electric circuit controlled from said crane and interrupted by said solenoid, substantially as shown and described.

3. A means for locking traveling cranes and similar constructions, comprising the combination of oppositely related tongue-pieces pivotally attached to and depending from the same, a solenoid on said crane, a lever suitably connected to the solenoid to be actuated thereby when the solenoid is energized, and to the tongue-pieces to raise the same around their pivotal connections to the crane when actuated, as aforesaid, and an electric circuit, controlled from said crane and interrupted by said solenoid substantially as shown and described.

4. The combination, with an electric traveling crane movably mounted upon rails and supporting ties, of oppositely related tongue-pieces pivotally attached at one end of said pieces to the frame work of said crane and depending downwardly therefrom below the upper surface of the ties, suitable solenoid mechanism on the crane to raise said pieces upwardly, around their pivotal connections with the crane, from below said surface of the ties when said solenoid is energized, and an electric circuit, controlled from said crane, and interrupted by said solenoid, substantially as shown and described.

5. The combination, with an electric traveling crane or similar structure, of oppositely related tongue-pieces pivotally attached at one end of said pieces to the frame-work of the crane, and depending downwardly therefrom in the path of its travel, stops suitably arranged at intervals in said path to engage said pieces when in their downwardly depending position, suitable solenoid mechanism on the crane to raise said pieces out of said engagement with the stops when the solenoid is energized, and thereafter to close the electric circuit that actuates the crane-traveling motor, together with a subordinate electric circuit for energizing said solenoid, substantially as shown and described.

6. The combination, with an electric traveling crane or similar structure, of oppositely related tongue-pieces pivotally attached at one end of said pieces to the framework of the crane, and depending downwardly therefrom in the path of its travel, stops suitably arranged at intervals in said path to engage said pieces when in

their downwardly depending position, suitable solenoid mechanism on the crane to raise said pieces out of said engagement with the stops when the solenoid is energized and to close an electric circuit that controls the crane-traveling motion circuit, together with electric circuits for severally

energizing said solenoid and said motor, substantially as shown and described.

WILL K. MONROE.

In presence of—

L. P. LIPPS,

J. P. DOWD.