

No. 704,019.

Patented July 8, 1902.

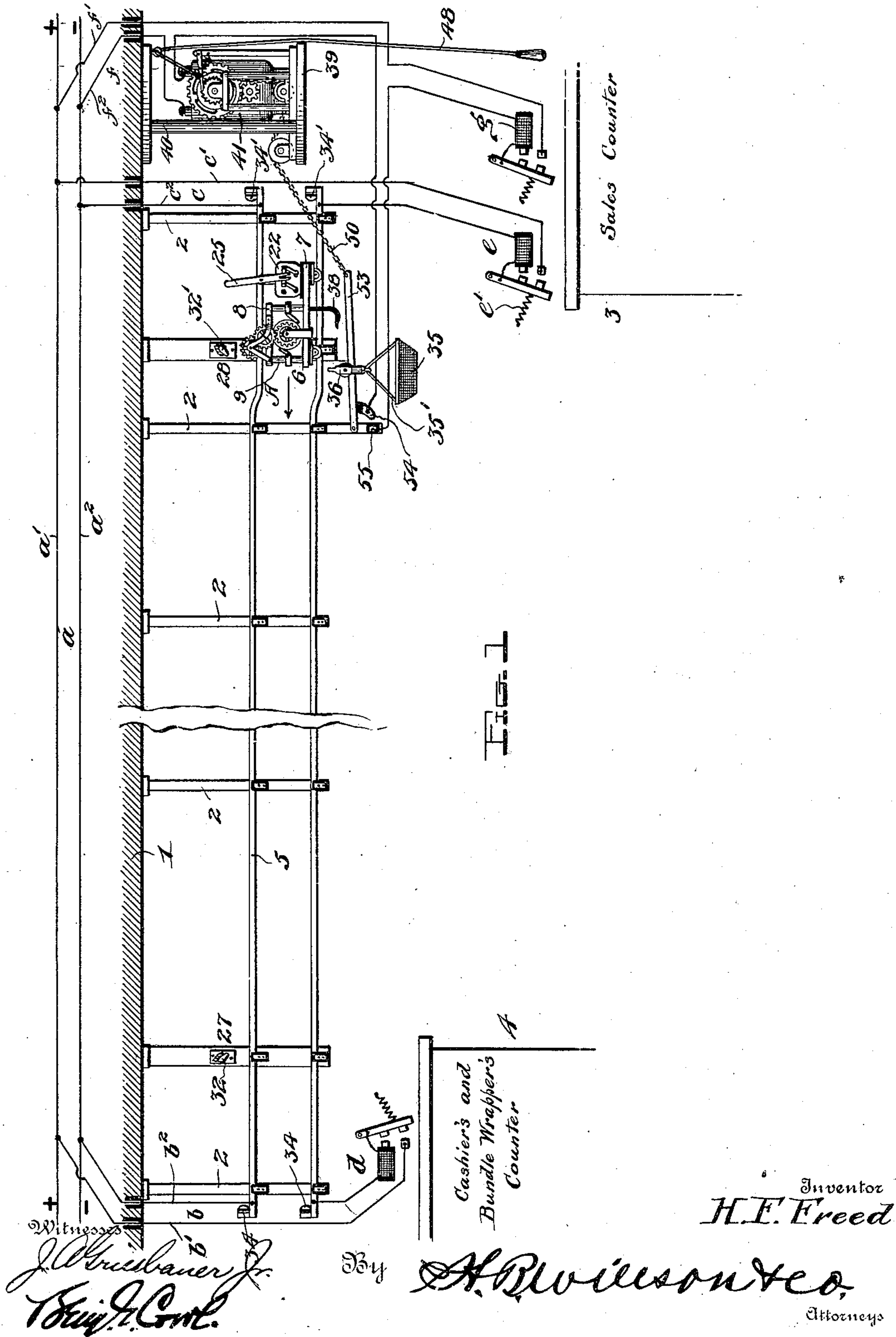
H. F. FREED:

ELECTRICAL TRANSPORTATION SYSTEM.

Application filed Mar. 11, 1901. Renewed Jan. 13, 1902.)

(No Model.)

4 Sheets—Sheet 1.



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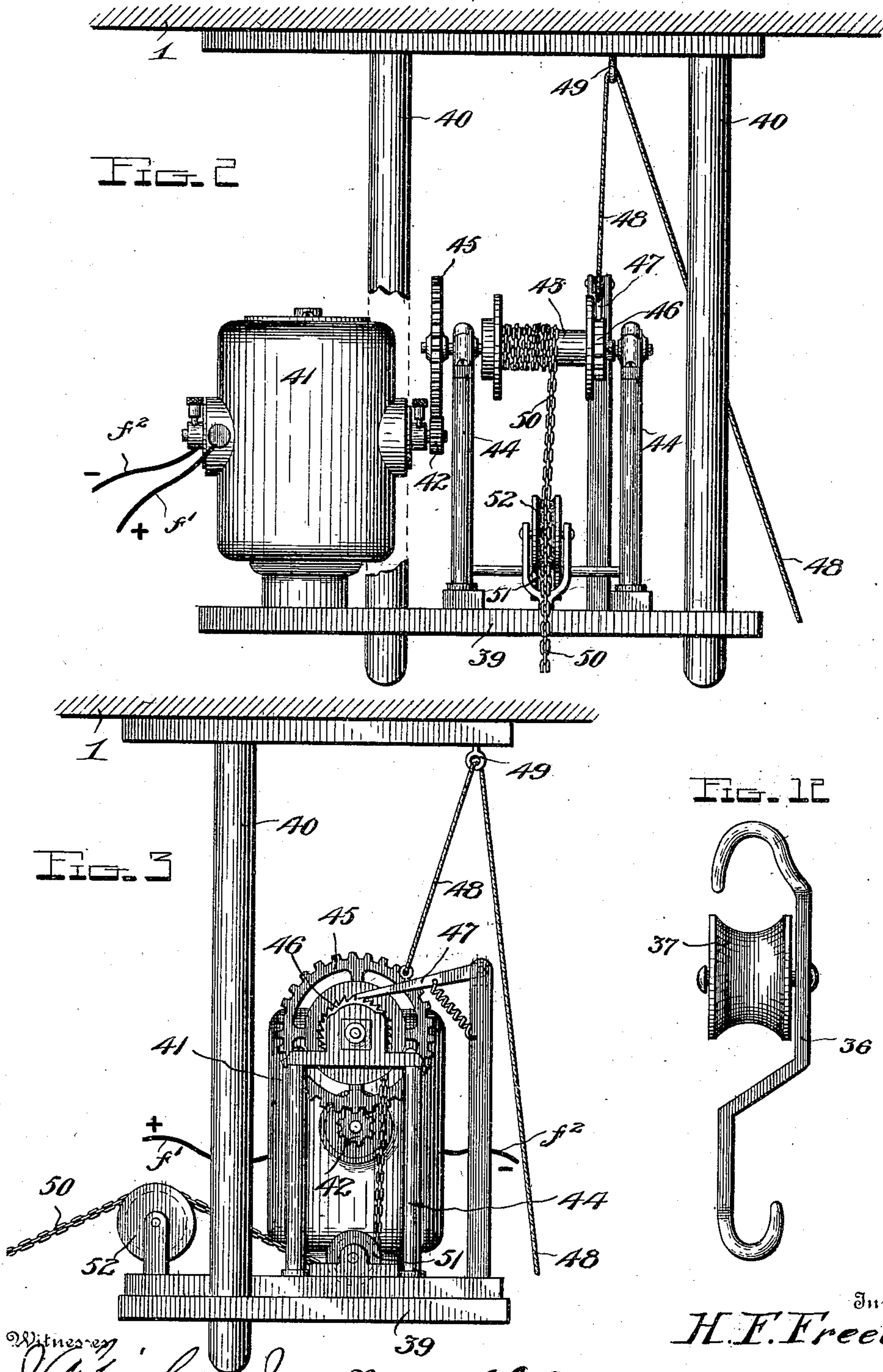
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(No Model.)

4 Sheets—Sheet 2.



Witness
J. C. Wiesbauer Jr.
Brig. Genl.

By

H. F. Freed
H. F. Freed & Co.

Inventor

Attorneys

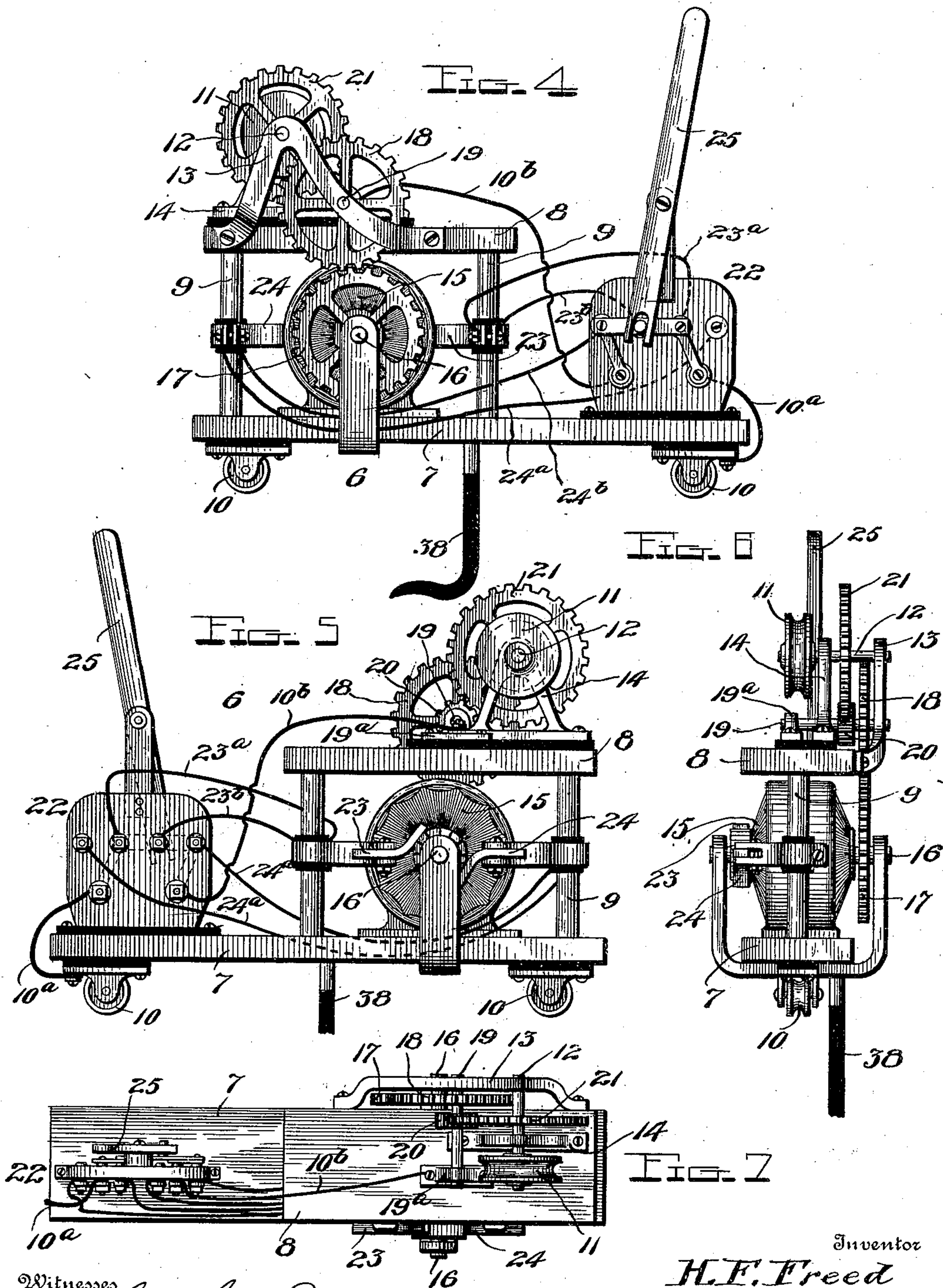
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4 Sheets—Sheet 3.



Witnesses

J. L. Grieshaber Jr.
By J. L. Grieshaber Jr.

By

H. F. Freed

Inventor

Attorneys

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4 Sheets—Sheet 4.

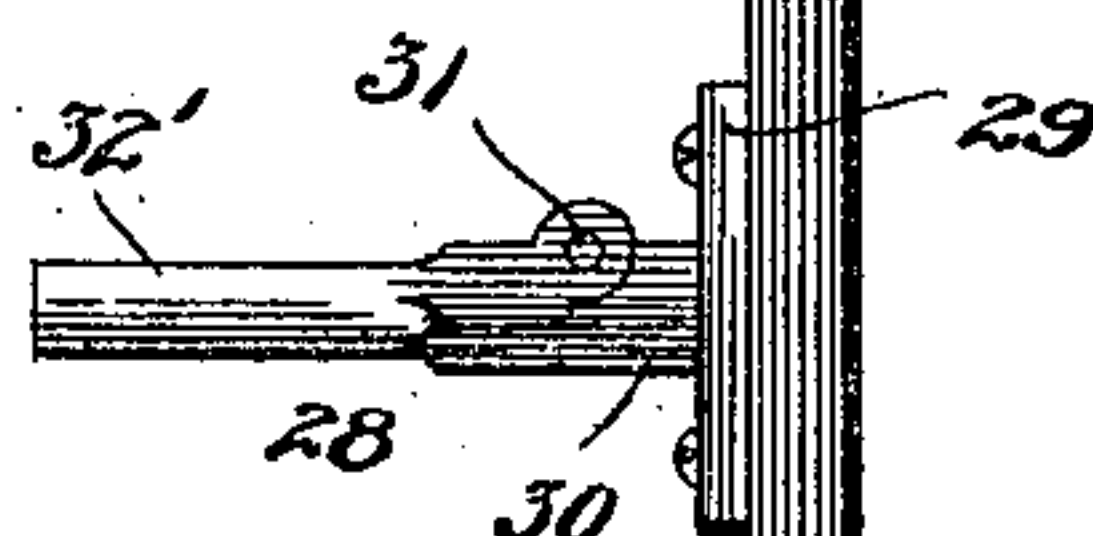
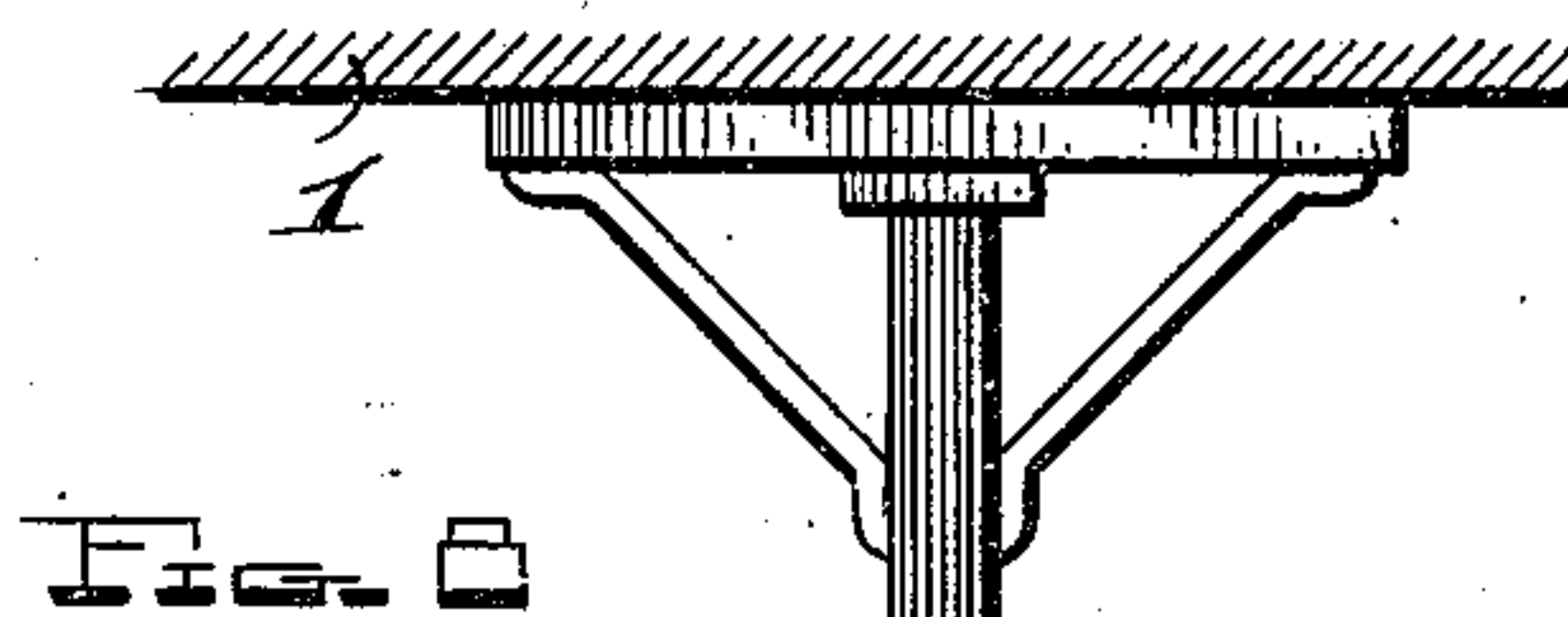
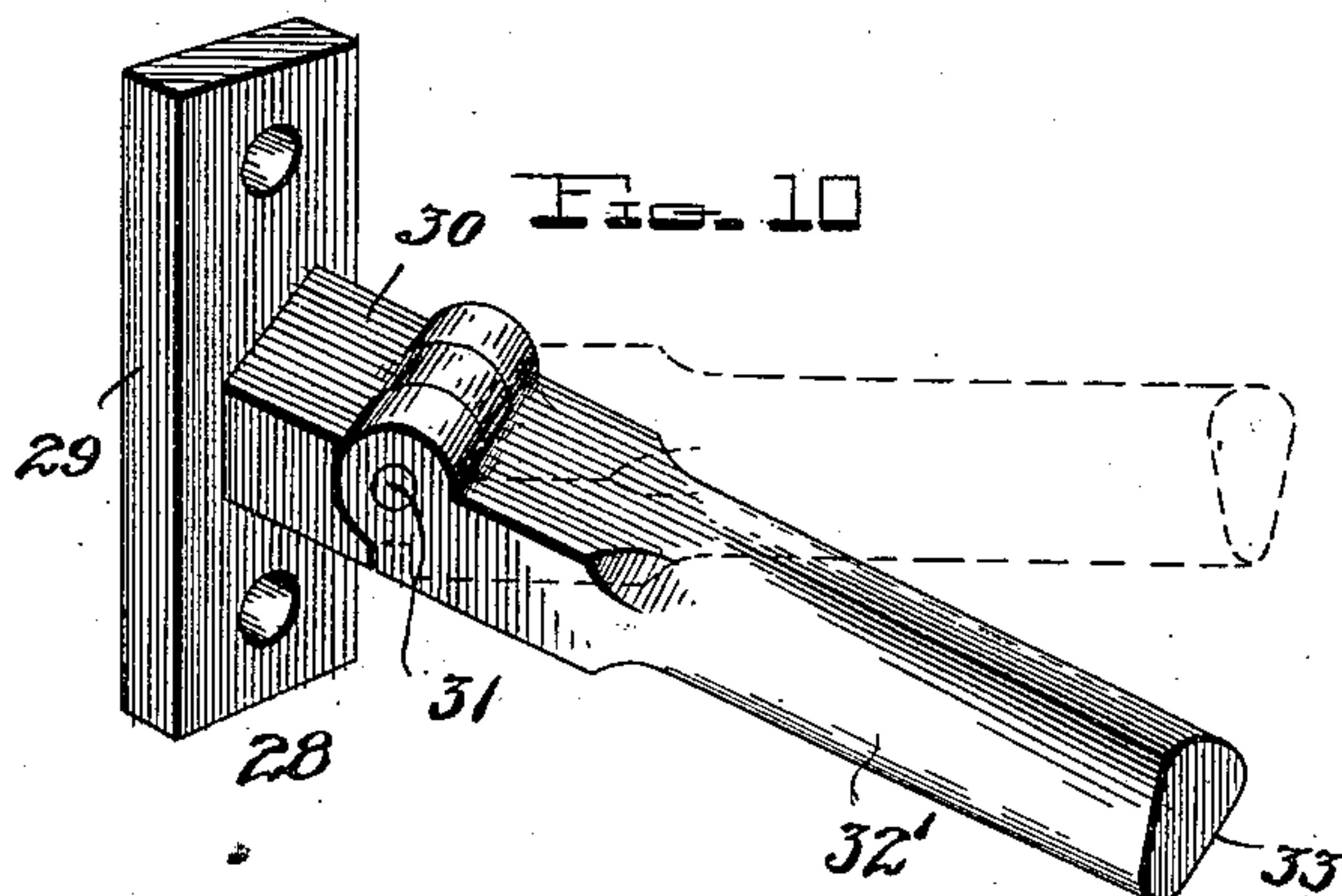


FIG. 11

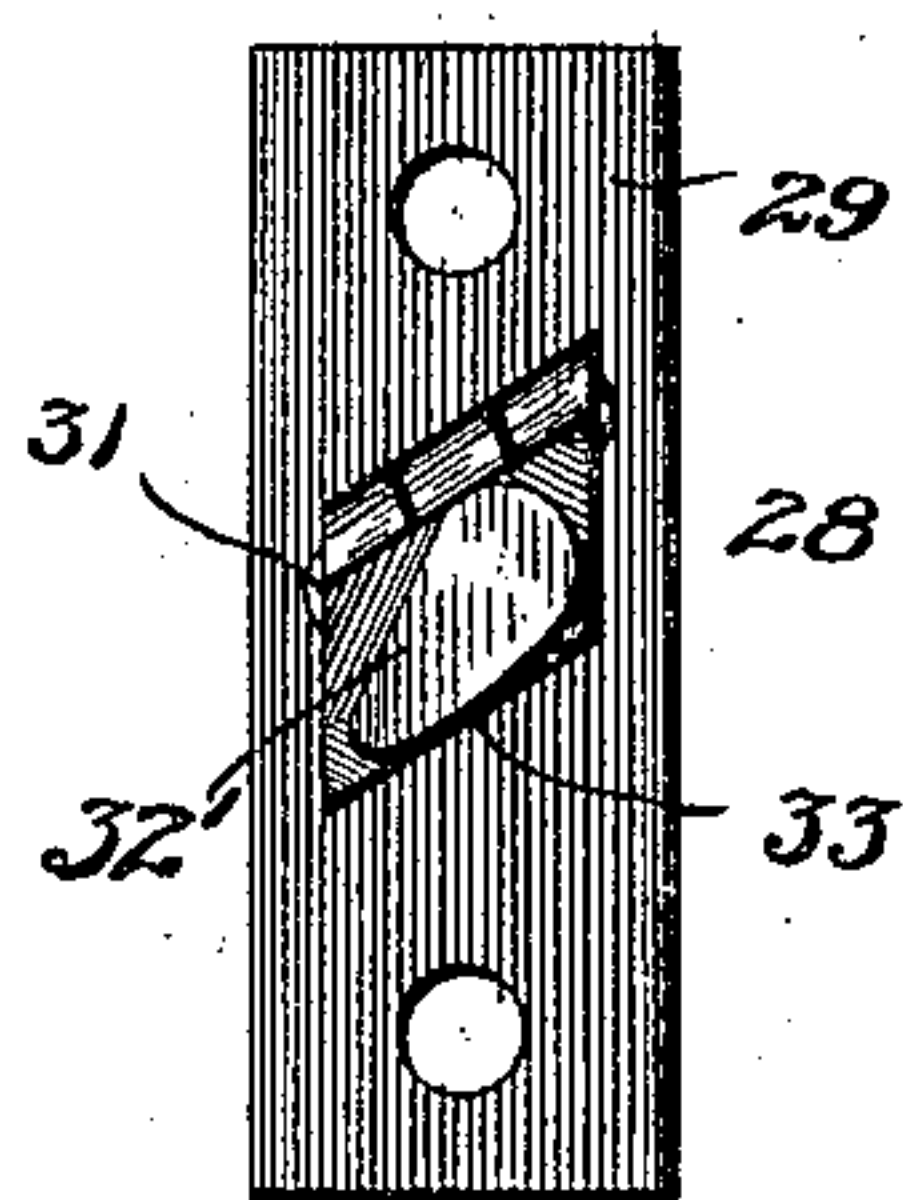
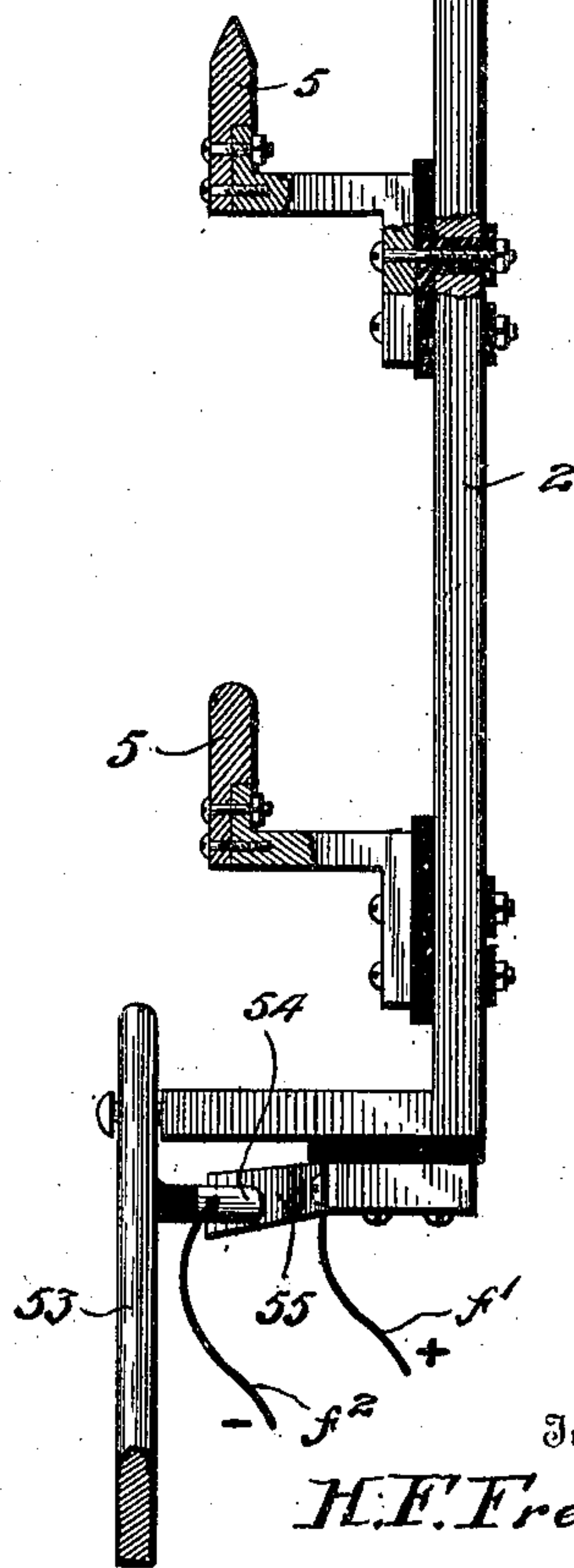
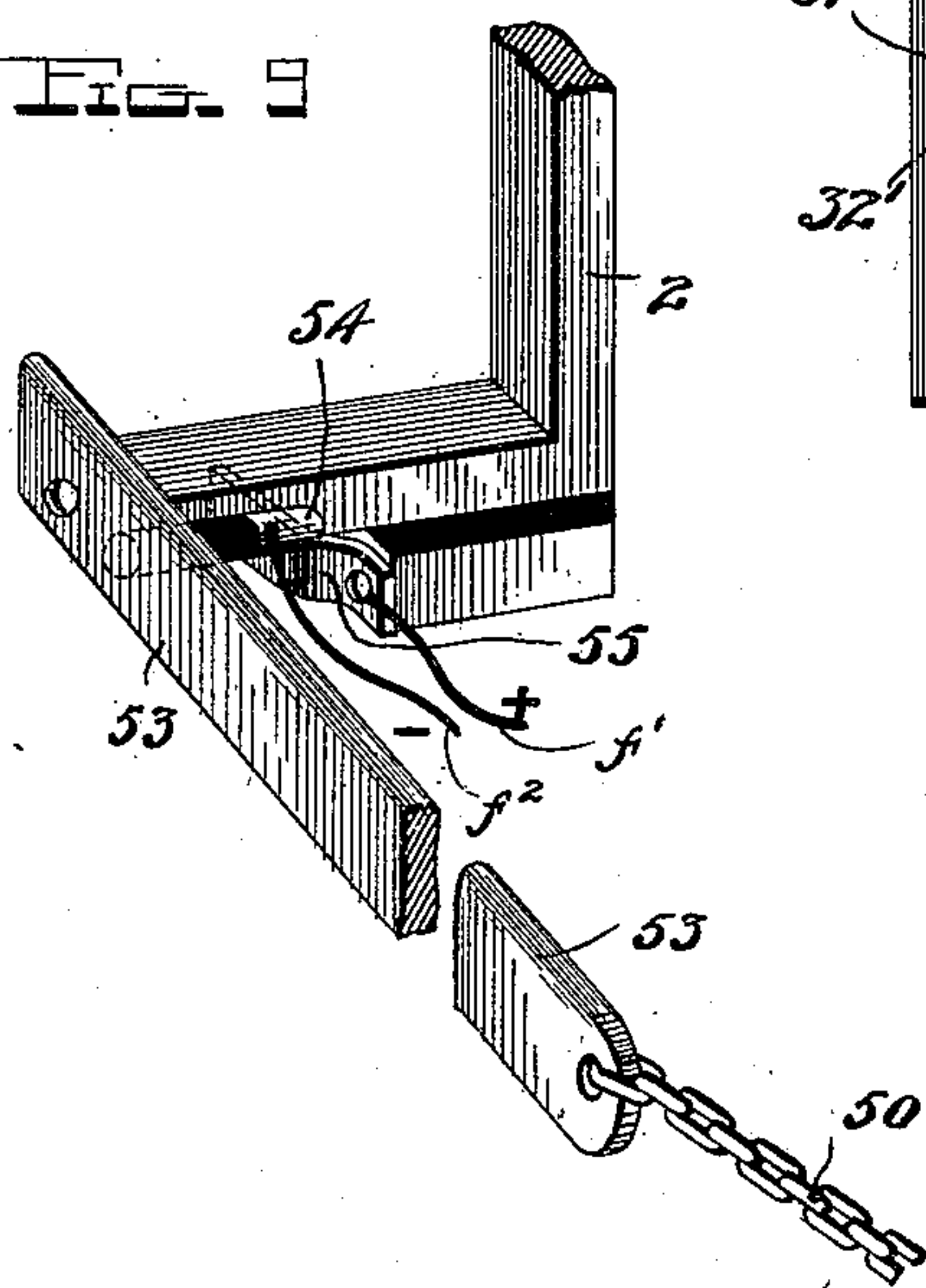


FIG. 3



Witnesses
J. A. Grubauer Jr.
Ben. J. Gove.

By

H. F. Freed

Inventor

Attorneys

UNITED STATES PATENT OFFICE.

HENRY FELIX FREED, OF HARRISBURG, PENNSYLVANIA, ASSIGNOR OF
NINE-TENTHS TO ISAAC FREED, OF HARRISBURG, PENNSYLVANIA, AND
SYLVESTER O. SPRING, OF PEORIA, ILLINOIS.

ELECTRICAL TRANSPORTATION SYSTEM.

SPECIFICATION forming part of Letters Patent No. 704,019, dated July 8, 1902

Application filed March 11, 1901. Renewed January 13, 1902. Serial No. 89,462. (No model.)

To all whom it may concern:

Be it known that I, HENRY FELIX FREED, a citizen of the United States, residing at Harrisburg, in the county of Dauphin and State of Pennsylvania, have invented certain new and useful Improvements in Electrical Transportation Systems; and I do 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.

The invention relates to an electrical transportation system more especially intended for use in large stores for carrying bundles or cash from the sales-counter to the cashier's or bundle-wrapper's counter or other terminal point.

The object of the invention is to provide an improved electrical transportation system which may be easily, expeditiously, and economically installed; furthermore, to provide the carriage with a current-reversing switch which is automatically operated as the carriage approaches either end of the track to reverse the direction of movement of the motor when current is applied; furthermore, to provide quick-break switches to cut off the current from the motor by the shifting of the reversing-switch; furthermore, to provide an electrically-operated hoist for elevating the bundle or cash receptacle from the sales-counter to a point where it may be connected to the carriage in its movement from one end of the track to the other; furthermore, to provide means for automatically releasing the bundle or cash receptacle from the carriage when it arrives at the sales-counter end of the track; furthermore, to provide means for allowing the said receptacle to lower or descend within convenient reach of the salesman after it has been released from the carriage, and, finally, to provide an electrical transportation system of this character which will perform its work in an efficient and expeditious manner and with a minimum amount of labor.

With these and other objects in view the invention consists of certain novel features of construction, combination, and arrange-

ment of parts, which will be hereinafter more fully described, and particularly pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a diagrammatical conventional representation of my improved electrical transportation system. Fig. 2 is an end view of the hoisting device. Fig. 3 is a side elevation of the same. Fig. 4 is a view taken from one side of the carriage. Fig. 5 is a similar view taken from the opposite side of the carriage. Fig. 6 is an end view of the carriage. Fig. 7 is a top plan view of the same. Fig. 8 is a side view of one of the track-hangers, showing the track-rails in section and parts broken away to illustrate the insulation. Fig. 9 is a view of the lower end of one of the hangers, illustrating the swinging lever used for elevating and lowering the bundle or cash receptacle and the sliding electrical contact. Fig. 10 is a detail perspective view of the trip for shifting the reversing-switch lever. Fig. 11 is an end view of the same, and Fig. 12 is a side elevation of the receptacle-supporting hook.

In the drawings, 1 denotes the store-ceiling; 2, the track-hangers depending therefrom; 3, the sales-counter, and 4 the cashier's and bundle-wrapper's counter at an elevation above the sales-counter.

5 denotes track-rails secured to the hangers 2, one above the other and insulated therefrom. At the sales-counter end the rails are deflected downwardly for a purpose hereinafter to appear and remain parallel with each other, as shown.

6 denotes a carriage the frame of which consists of a base 7, a shelf 8, supported above the base by posts 9, the grooved track-supporting wheels 10, journaled in brackets secured to the lower side of the base and adapted to travel on the lower track-rail, and the grooved propelling-wheel 11, fixed to a shaft 12, journaled in bearings 13 14, projecting from the shelf and insulated therefrom.

15 denotes an electric motor suitably mounted upon the base of the carriage and has fixed to its armature-shaft 16 a gear-wheel 17, which in turn meshes with a gear-wheel 18, fixed to a shaft 19, mounted in bearings 19^a, insulated

from the shelf. This shaft 19 has also fixed to it a pinion 20, which meshes with a gear-wheel 21, fixed to the shaft 12, thus transmitting the movement of the motor to the propelling-wheel 11.

22 denotes a current-reversing switch of any well-known or approved construction and connected to the brushes 23 24 by wires 23^a 23^b and 24^a 24^b in a manner common to this class of switches, whereby when the pivoted lever 25 is moved from one side to the other the direction of flow of the current through the motor will be reversed, thus reversing the direction of rotation of the armature-shaft and causing the carriage to travel in an opposite direction. The current is taken from the lower track-rail, flows through one of the wheels 10, its bearing-bracket, through a wire 10^a, through the switch, thence through the motor back to the switch, thence from the switch through the wire 10^b, and thence from the wire 10^b through the train of gearing to the propeller-wheel 11, and from thence to the upper track-rail. When the lever 25 is reversed and the switch shifted, the current flows through the motor in an opposite direction, thus reversing the direction of movement of the armature-shaft and causing the carriage to travel in an opposite direction. As the particular form of motor and reversing-switch form no part of the present invention, but are simply adjunctive thereto and may be changed at will without departing from the spirit of the invention, a further or detailed description of these parts is thought to be unnecessary.

Near each end of the track and located above the upper rail and secured to one of the track-hangers are trip devices, one indicated by 27 and the other by 28. The trip devices consist of the plates 29, secured to the track-hangers and provided with studs 30, to which are connected by diagonal pivots 31 arms 32 32', which have swinging movements upwardly in inclined planes and which are located in the path of movement of the reversing-lever 25. The arms being connected to the studs 30 by the pivots 31 in rule-joint fashion will be permitted to swing upward from a horizontal position, but cannot swing downward below a horizontal plane. The arms of the trip devices are arranged to swing toward each other, or, in other words, in opposite directions, and are preferably constructed with a beveled lower side 33, so as to more readily free themselves from the upper end of the reversing-lever 25 when it engages and slides under the arms.

I will now describe and trace the circuits for propelling the carriage.

Referring to Fig. 1, *a* denotes the main or closed circuit, consisting of the conductor-wires *a'* *a*². *b* and *c* denote branch circuits consisting, respectively, of the wires *b'* *b*² and *c'* *c*². The wires *b'* *b*² are connected to the track-rails at one end and the wires *c'* *c*² are connected to the track-rails at the other end.

The branch circuit *b* has installed within it a quick-break switch *d*, and the branch circuit *c* has installed within it a similar quick-break switch *e*. These switches may be of the usual and well-known construction and further description of the same is not deemed necessary.

I will now proceed to describe the operation of the carriage.

Referring to Fig. 1, the carriage is shown at the right-hand end of the track and the lever 25 in a position to energize the motor to drive the carriage in the direction indicated by the arrow A. The quick-break switch *e* is now closed, thus completing the circuit through the wire *c'*, the quick-break switch *e*, the lower track-rail, the reversing-switch and carriage, the train of gearing, the propeller-wheel 11, the upper track-rail, and the wire *c*². The carriage is now driven in the direction of the arrow A, and the lever 25 striking the arm 32' elevates said arm and passes under the same without reversing the lever. When the carriage reaches the opposite end of the track, the lever 25 will strike the arm 32, and as said arm will not swing upward when struck by the lever when the carriage is moving in the direction of the arrow A the lever will be shifted to reverse the flow of current through the motor, and in this shifting movement the current will be broken, thus demagnetizing the electromagnet on the quick-break switch *e* and permitting its armature to swing away from the magnet under the action of the coil-spring *e'*. The circuit *c* is now broken and the carriage comes to a rest on its own account or is brought to a halt by the buffers 34 at the end of the track-rails. In passing under the trip-arm 32 the switch-lever 25, as above described, has broken the circuit *c*, which through the instrumentality of the quick-break switch *e* remains broken and has been swung to a position opposite to that shown in Fig. 1 to reverse the motor. The operator at the left-hand end of the track now closes the circuit *b* by closing the quick-break switch *d*, thus completing the circuit through the carriage in the manner as hereinbefore described and causing the carriage to be propelled back to its starting-point. In returning to its starting-point the lever 25 will engage the arm 32, elevate and pass under the same without shifting, but in coming in contact with the arm 32' will be shifted in the manner hereinbefore described, and in the shifting of this lever the current will be momentarily broken, thus releasing the armature from the magnet of the quick-break switch *d* and causing the circuit *b* to remain broken. Buffers 34' may be secured to the right-hand end of the track to receive the impact of the carriage.

Any suitable form of package or cash receptacle may be employed. The one shown in the accompanying drawings and designated by the numeral 35 consists of a basket having a bail 35', which is supported from one

member of a double hook 36, which is provided with a grooved pulley 37. The other member of the double hook is adapted to be connected to the carriage in any suitable manner, preferably by securing to the carriage a hook 38, which engages the upper member of the double hook. This hook 38 is preferably made of fibrous non-conducting material.

I will now proceed to describe the mechanism for lowering the receptacle to the sales-counter and for raising it from the sales-counter to a position to be engaged and carried by the carriage—in other words, the hoist.

39 denotes a shelf supported by hangers 40 from the ceiling and having mounted thereon an electric motor 41, the armature-shaft of which is provided with a drive-pinion 42.

43 denotes a windlass mounted in bearing-posts 44 and provided at one end with a gear-wheel 45 in mesh with the drive-pinion 42. The other end of the windlass is provided with a ratchet-wheel 46, which is engaged by a spring-actuated pawl 47, to which is connected a rope 48, passed through an overhead eye 49 and extending to and within convenient reach of the salesman and by means of which the pawl may be released from the ratchet-wheel.

50 denotes a winding chain connected to the windlass and passing about suitable guide-pulleys 51 and 52.

53 denotes a lever pivoted to the depending angular end of one of the rail-hangers 2 and provided with the insulated contact-point 54, which is adapted to engage an insulated contact-point 55, secured to said angular end of the hanger. To the free or unpivoted end of this lever is connected the lower end of the chain 50. This lever extends immediately below the deflected portion of the track-rails for a purpose presently to appear.

The hoist-circuit is designated by the letter f and consists of the wires $f' f^2$, connected to the wires $a' a^2$. This circuit f has installed within it the hoisting-motor 41 and a quick-break switch g , similar in construction, action, and function to the quick-break switches $d e$, hereinbefore described. The opposite ends of the wires $f' f^2$ are connected, respectively, to the contact-points 55 54. When these contact-points 55 54 are in electrical connection and the quick-break switch g closed, the current flows through the wire f' , through the quick-break switch g , through the contact-points 55 54, through the wire f^2 , through the motor, and back to the main or closed circuit a .

The operation of the hoisting device is as follows: Referring to Fig. 1, it will be assumed that the carriage has just returned from the cashier's or bundle-wrapper's counter to the salesman's counter. On entering the deflected portion of the track the carriage lowers the wheel 37 of the double hook upon the inclined rail 53, which will slightly check the momentum of said hook and its suspended

receptacle and allow the carriage to free itself and continue on toward the end of the track, where it is brought to a halt by the buffers 34'. To lower the hook and receptacle after they have been disengaged from the carriage, the free end of the cord or rope 48 is grasped and drawn downward, thus releasing the spring-actuated pawl from the ratchet-wheel 46 and allowing the windlass to unwind the chain 50, thus lowering the unpivoted end of the lever 53 and allowing the receptacle to descend to within convenient reach of the salesman. In this downward movement of the lever the contact-points 55 54 are brought together; but as the quick-break switch g is held open by its spring no current as yet passes through the hoisting-motor 41. When it is desired to elevate the receptacle to the position shown in Fig. 1, the quick-break switch g is closed, thus completing the circuit through the wires $f' f^2$ and starting the hoisting-motor 41. The movement of this motor, as hereinbefore explained, is communicated to the windlass 43, which will wind up the chain 50, thus swinging upwardly the unpivoted end of the lever 53 until the receptacle reaches the position shown in Fig. 1, at which instant the contact-point 54 will have slid past the contact-point 55, thus breaking the circuit and causing the motor to come to a state of rest. At the instant the contact-points 54 and 55 separate the quick-break switch g is opened, so that after the carriage has been propelled to the cashier's or bundle-wrapper's counter and has been returned to the salesman's counter and the double hook again lowered into engagement with the pivoted lever 53 said lever will be in condition to be lowered by releasing the pawl 47 from the ratchet-wheel 46, although in this lowering action the contact-points 54 55 are brought together.

From the foregoing description, taken in connection with the accompanying drawings, the construction, operation, and advantages of this system will be apparent without requiring an extended explanation.

It will be noticed that in order to lower the receptacle 35 it is only necessary to release the pawl 47 from the ratchet-wheel 46, to elevate the receptacle, to close the quick-break switch g , and to propel the carriage from one end of the track to the other to close one of the quick-break switches $d e$. It will thus be seen that the system is a simple and practical one, easily operated, and may be installed at a comparatively small cost, and by its use time and labor are reduced to a minimum.

While I have shown and described the invention as a store-service apparatus, it is evident that by slight changes and modifications the system can be used for other purposes, and therefore I would have it distinctly understood that I do not desire to be confined to any particular use of the system,

but reserve to myself the right to employ it wherever and for whatever purpose I may find the same adaptable.

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

1. In an electrical transportation system, the combination of separate track-rails, a carriage supported to travel upon said track-rails, an electric motor carried by said carriage and geared with one of the track-rails, a reversing-switch carried by said carriage and circuited with said electric motor and said separate track-rails, quick-break switches circuited with the track-rails, and means located within the path of movement of the reversing-switch to shift said reversing-switch to break the circuit, open said quick-break switch and reverse said reversing-switch, substantially as set forth.
2. In an electrical transportation system, the combination of separate track-rails, a motor-carriage mounted to travel along said track-rails, a reversing-switch carried by said carriage and circuited with the motor and track-rails, quick-break switches located near the ends of said track-rails and circuited therewith and devices arranged within the path of movement of the reversing-switch for operating said reversing-switch to break the circuit through the track-rails and quick-break switches and for reversing said reversing-switch, substantially as set forth.
3. In an electrical transportation system, the combination of the separate track-rails, a motor-carriage mounted to travel along said track-rails, a reversing-switch having a shifting-lever and carried by said carriage, quick-break switches, said reversing-switch circuited with the motor, the track-rails and the quick-break switches, trips arranged at opposite ends of the track within the path of movement of said lever, each trip movable by pressure from one direction to permit the lever to pass freely from engagement with it without being reversed and immovable by pressure from the opposite direction to trip said lever to reverse the switch, said trips being movable in opposite directions, substantially as set forth.
4. In an electrical transportation system, the combination of the separate track-rails, a motor-carriage mounted to travel along the track-rails, a reversing-switch having a shifting-lever and carried by said carriage, quick-break switches, said reversing-switch circuited with the motor, the track-rails and the quick-break switches, trips arranged near the opposite ends of the track within the path of movement of the shifting-lever, said trips mounted to swing in opposite directions from their normal positions within the path of movement of the shifting-lever, in an inclined plane out of the path of movement of said shifting-lever, substantially as set forth.
5. In an electrical transportation system, the combination with track-rails and an electrically-propelled carriage, of a receptacle or car releasably connected to the carriage, a lever pivoted adjacent to the rails in position to receive the receptacle or car and disengage it from the carriage and means for lowering said lever with its supported receptacle or car, substantially as set forth.
6. In an electrical transportation system, the combination with track-rails and an electrically-propelled carriage, of a receptacle or car releasably connected to the carriage, a lever pivoted adjacent to the rails in position to receive the receptacle or car and disengage it from the carriage, means for lowering said lever with its supported receptacle or car, and means for elevating said lever to raise the receptacle or car within the path of movement of the carriage, substantially as set forth.
7. In an electrical transportation system, the combination with the track-rails and an electrically-propelled carriage, of a receptacle or car releasably connected to the carriage, a lever pivoted adjacent to the rails in position to receive the receptacle or car and disengage it from the carriage, and means for elevating the lever to raise the receptacle or car within the path of movement of the carriage, substantially as set forth.
8. In an electrical transportation system, the combination with the track-rails deflected at one end and the electrically-propelled carriage mounted to travel along said track-rails, of a receptacle or car releasably connected with said carriage, a bar or lever arranged under the track-rails and normally retained at an angle to the track-rails in position to release the car or receptacle from the carriage and support the same, and means for raising and lowering said bar, substantially as set forth.
9. In an electrical transportation system, the combination with the track-rails and the carriage mounted thereon, of a car or receptacle releasably connected to the carriage, a bar supported under the track, and designed to disengage the car or receptacle from the carriage, and an electric motor for moving said bar upward to raise the car in the path of movement of the carriage, substantially as set forth.
10. In an electrical transportation system, the combination with the track-rails and the carriage mounted to travel thereon and provided with a hook, a bar or lever mounted below the track-rails, of a car or receptacle, and a double hook connecting the car or receptacle with the carriage and provided with a grooved wheel to ride upon the bar or lever, substantially as set forth.
11. In a hoisting device for the purpose described, the combination of a suitably-supported windlass, an electric motor geared to the windlass, a hoisting bar or lever, a connection between the hoisting bar or lever and the windlass, a contact-point, a second con-

tact-point carried by the lever and adapted to engage with the first contact-point, and a switch circuited with the motor and the contact-points, substantially as set forth.

5 12. In a hoisting device for the purpose described, the combination of a suitably-supported windlass, an electric motor geared to the windlass, a hoisting bar or lever, a connection between the hoisting bar or lever and
10 the windlass, a contact-point, a second contact-point carried by the lever and adapted to engage with the first contact-point, and a quick-break switch circuited with the motor and the contact-points, substantially as set
15 forth.

13. In a hoisting device for the purpose described, the combination of a suitably-sup-

ported windlass, an electric motor geared to the windlass, a pawl and ratchet for controlling the backward movement of the windlass, 20 a hoisting bar or lever, a connection between the hoisting bar or lever and the windlass, a contact-point, a second contact-point carried by the lever and adapted to engage with the first contact-point, and a switch circuited with 25 the motor and the contact-points, substantially as set forth.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

HENRY FELIX FREED.

Witnesses:

W. T. IRWIN,

W. I. SLEMMONS.