

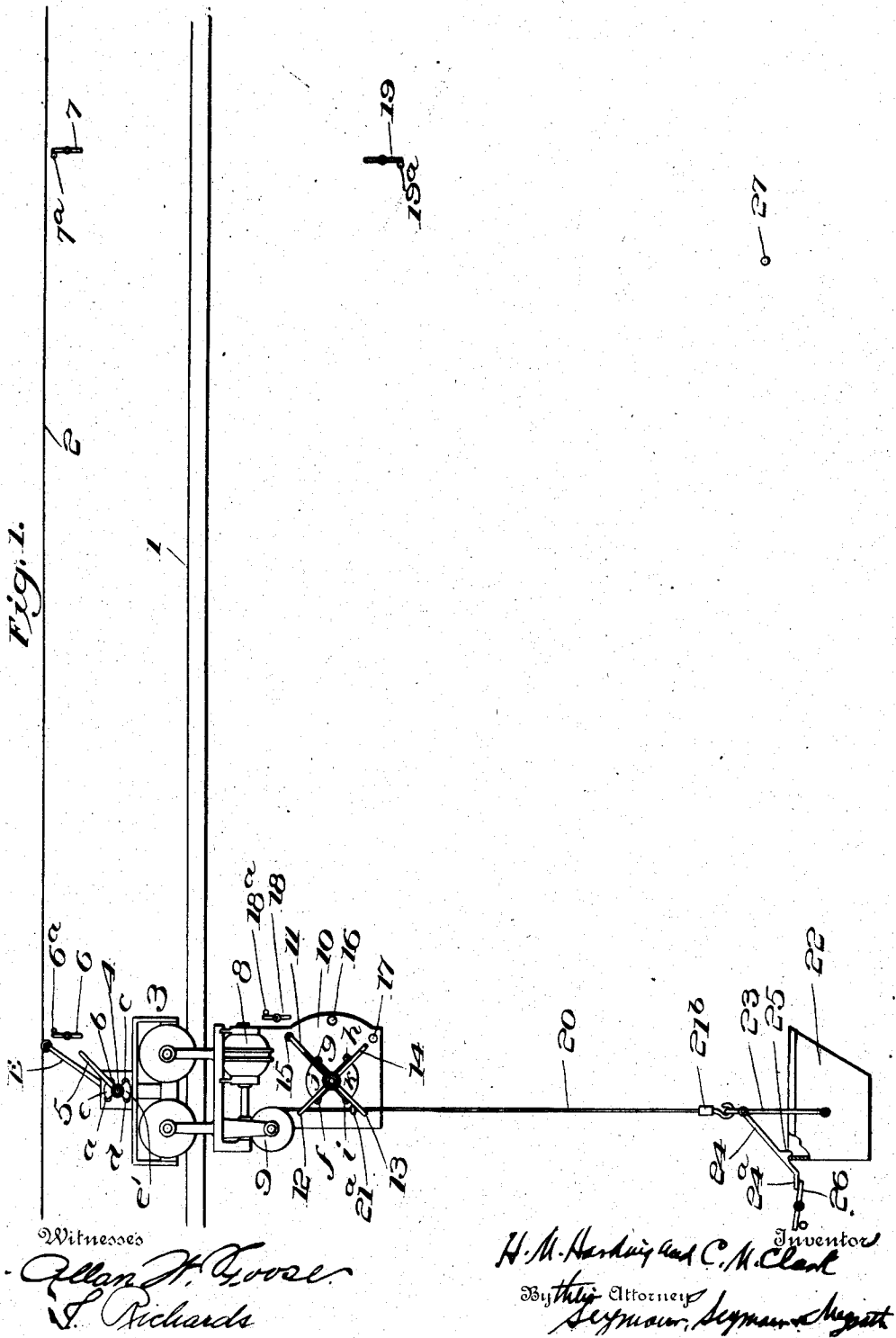
No. 878,797.

PATENTED FEB. 11, 1908.

H. M. HARDING & C. M. CLARK
TELPHER.

APPLICATION FILED APR. 13, 1905.

4 SHEETS—SHEET 1.



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4 SHEETS—SHEET 2.

Fig. 2.

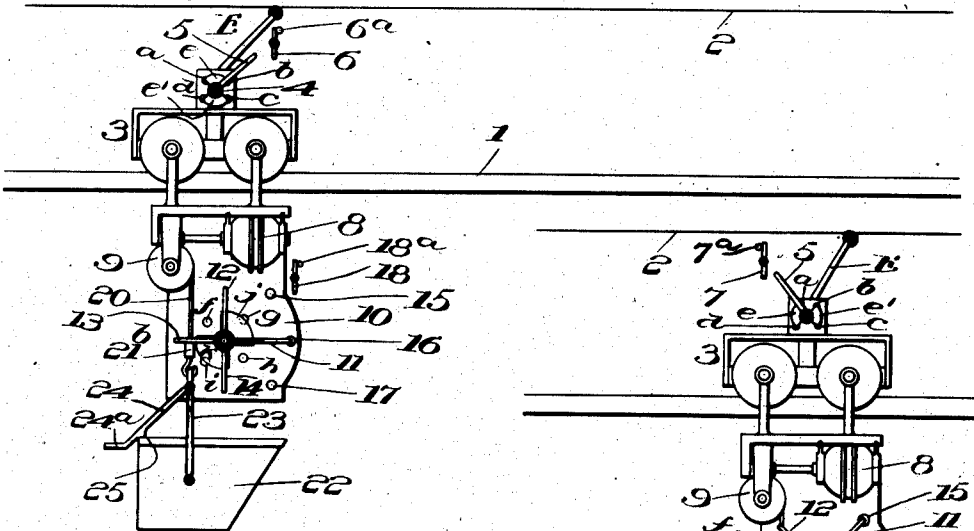
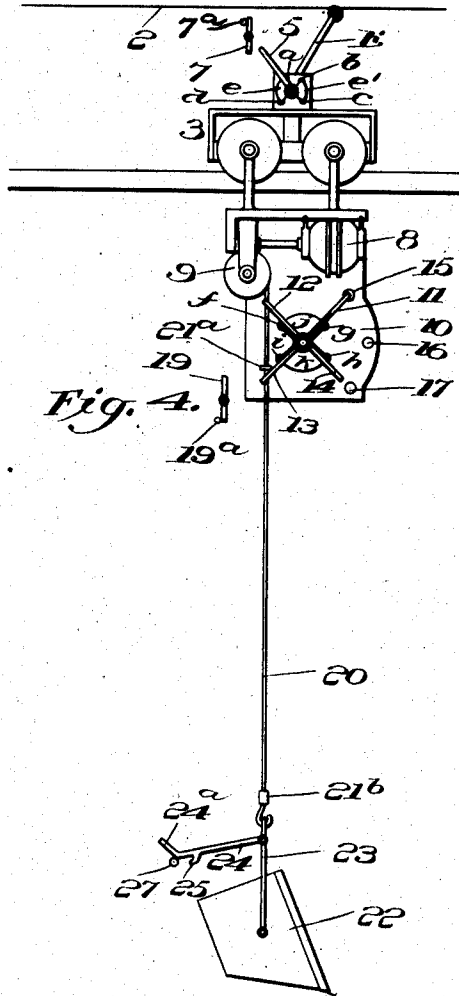


Fig. 4.



Witnesses

Witnesses
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4 SHEETS—SHEET 3.

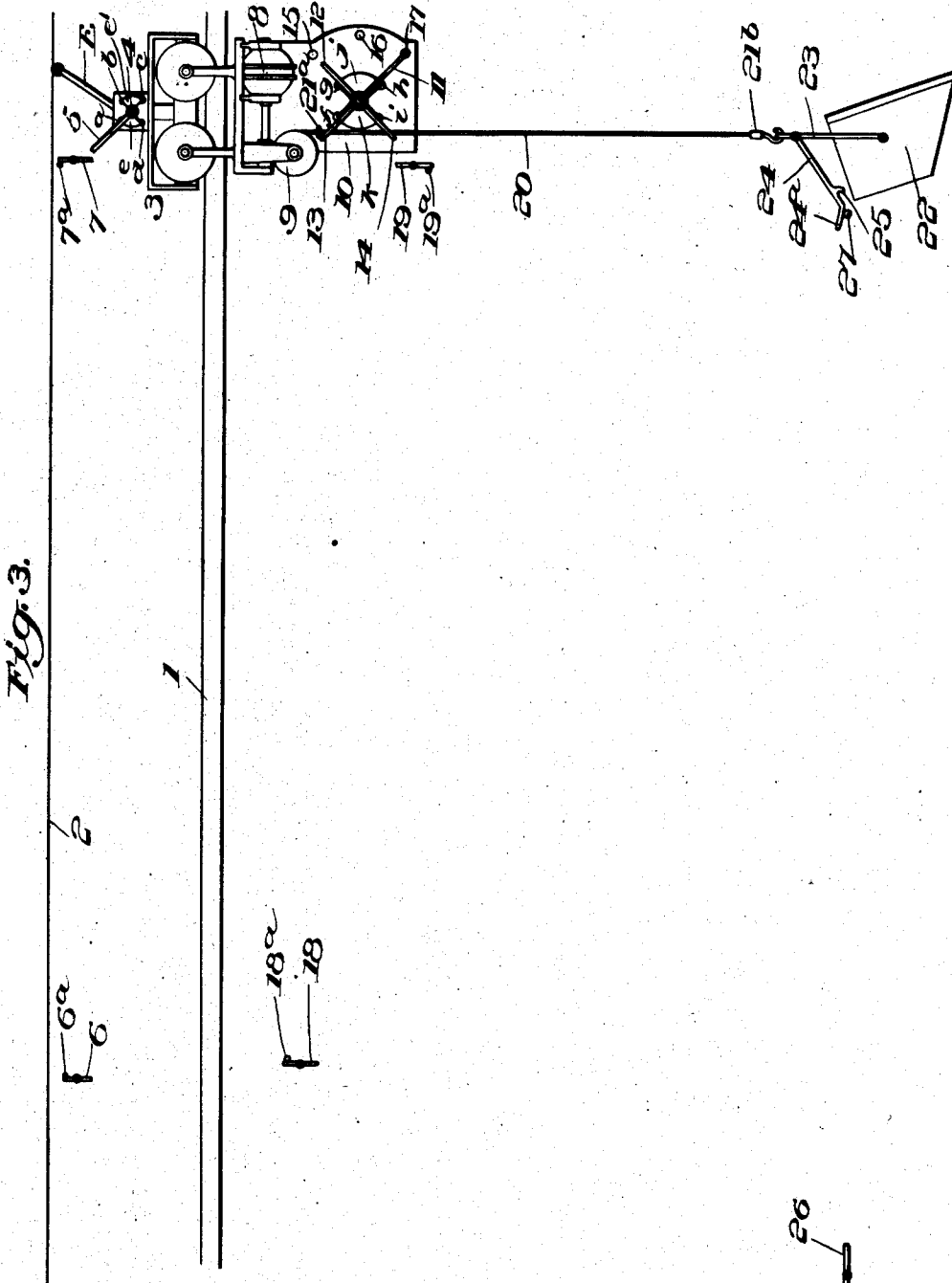


Fig. 3.

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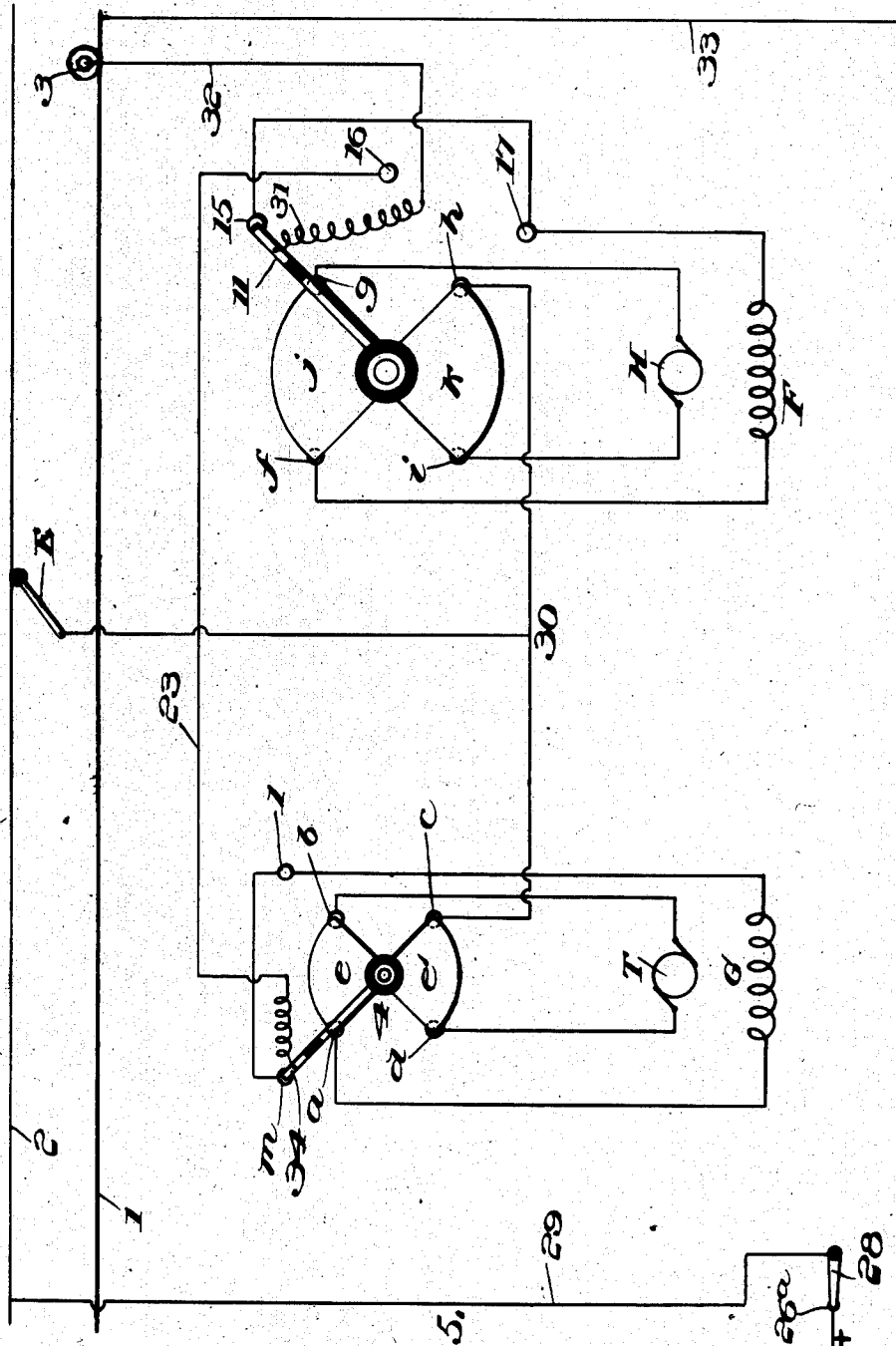
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4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

HENRY M. HARDING, OF NEW YORK, N. Y.; AND CHARLES MARTIN CLARK, OF SOUTH ORANGE, NEW JERSEY.

TELPHER.

No. 878,797.

Specification of Letters Patent.

Patented Feb. 11, 1908.

Application filed April 13, 1905. Serial No. 255,292.

To all whom it may concern:

Be it known that we, HENRY M. HARDING, residing in the city, county, and State of New York, and CHARLES M. CLARK, residing in the city of South Orange, county of Essex, and State of New Jersey, have jointly invented certain new and useful Improvements in Telphers, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in telphers and has for its object to provide means for automatically raising a load at one station, transferring the load to another station, lowering the load, raising the load carrying device, transferring the load carrying device to the first station and lowering it to be reloaded.

Other objects will appear from the herein-after description.

One embodiment of my invention is set forth in the following description and illustrated in the accompanying drawings which form a part of this application.

Referring to the drawings in which the same reference character indicates the same part in the several views, Figure 1 shows one type of my apparatus with the telpher at say the home station and the load carrying device, in this case a bucket, in its lowered position with the telpher switch in position to move the telpher to the right. Fig. 2 shows the telpher at the home station with the bucket in its raised position. Fig. 3 shows the telpher at an outlying station with the bucket dumped and nearly in its lowered position and with the switch on the telpher turned to cause the telpher to travel towards the left. Fig. 4 is a similar view to Fig. 3 with the bucket in its lowered position. Fig. 5 is a diagrammatic view of certain of the electric wires.

The part marked 1 on the drawing represents the track on which the telpher travels.

2 is the current wire.

3 is the telpher.

4 is the switch carried by the telpher and is used to automatically change the direction of the current so that the telpher may be made to travel in one direction or the other according to which way the switch is turned. This switch is provided with a lever 5 which,

when the telpher is moving in one direction, to the left for instance, will strike the stop 6 and be thrown to the right, as shown in Fig. 1, in which position the switch is in position to cause the telpher to travel to the right when the current passes through it. When the telpher travels to the right until the lever 5 hits the stop 7 the said lever is turned to the left and the switch is changed so that the telpher will travel to the left when the current is passed through it. Each of these stops 6 and 7 are pivoted so that they will throw the lever 5 when the telpher is moving in one direction, and will permit the said lever to pass under them when the telpher is moving in an opposite direction, 6^a and 7^a being pins to prevent these stops from moving when the switch lever 5 is to be moved.

a, b, c and d are terminals carried by the telpher switch and e and e' are copper plates or conductors extending from one of these binding posts or terminals to the other. These copper plates are pivoted on the same axle on which the lever 5 is pivoted. Depending from the telpher and carried thereby is the hoisting motor 8 which is connected to and drives the hoisting drum 9.

10 is a plate or frame connected to the frame on which the hoist motor is secured.

11 is a pivoted switch arm which is automatically moved in one direction or the other and governs the direction of motion of the hoisting apparatus, and also cuts in and out the telpher from the circuit. Secured to the pivoted switch arm 11 are a series of arms 12, 13 and 14.

f, g, h and i are terminals and j and k are copper plates or connections extending from one of these terminals to the other and govern the direction of the current to the hoisting motor.

15, 16 and 17 are other terminals with certain points of which the switch arm 11 comes in contact and cuts the telpher motor in and out, as the case may be and also governs the direction of the current to the hoisting motor.

18 and 19 are pivoted stops of the same construction as 6 and 7 and are used to throw the hoisting switch when one of the arms, 12, 13 or 14 strikes it. Adjacent to these pivoted stops are the pins 18^a and 19^a which prevent these stops from moving in one direc-

tion and permits the hoisting apparatus to pass thereby without operating the hoisting switch.

20 is the hoisting rope which is connected to the hoisting drum 9. On this hoisting rope near the upper end thereof is the enlargement or stop 21^a, the lower end of the rope being provided with another stop 21^b.

22 is the means for carrying the load, in this instance a bucket, having pivoted thereto the bail 23 which is secured to the lower end of the hoisting rope 20.

24 is a catch pivoted to the bail and has a hook 25 which engages the edge of the bucket and prevents the bucket from turning over and dumping its load. This catch 24 is provided with a finger 24^a which comes in contact with the pivoted switch 26 and operates the switch when the bucket is lowered at the home station.

27 is a pin at an outlying station against which the finger 24^a strikes and causes the catch 24 to release from the bucket when the bucket is lowered so that it may be dumped, as shown in Figs. 3 and 4.

We will now describe as much of the electric wiring as is necessary to a thorough understanding of our invention. This is shown in Fig. 5 of the drawing.

The electric mains are represented by the plus and minus signs. The plus main leads to the trolley wire and the negative to the ground return. The plus wire is connected to the binding post or terminal 26^a.

28 is a pivoted switch to which the wire 29 leading to the main trolley wire 2 is connected. Considering the conditions as shown on this diagram, at which time the bucket will be in the lowest position, if we start at the trolley wire and trace the current down through the trolley pole E to the point marked 30, it will be seen that the current can travel in either direction. That is, from the point 30 to the terminal *h*, or from 30 to the terminal *c*. If it be assumed that the current passes from 30 to *h*, it will pass across the copper plate or disk *k* to the terminal *i*, through the armature H of the hoist motor, then to the terminal *g* across the other copper plate *j* to the terminal *f*, thence through the field F of the hoist motor to terminal 17, to terminal 15 and then through the switch arm 11, through the flexible connection 31, through the wire 32, and back to the ground through the wire 33. It will thus be seen that the current is passing through the hoist motor, and the direction in which the motor is running will determine whether the load will be raised or lowered. In the instance shown, we will assume that the load has just arrived at the completion of its lowering movement.

In tracing the current from the point 30 towards the terminal *c*, it will be noticed that at *c* the current will pass to *d*, through the

copper plate *e*, thence to the armature of the telpher motor T to terminal *b*, through the copper plate *e* to terminal *a*, thence through the field G of the telpher motor to the terminal *l* then to terminal *m*, then through the lever arm 34, through the flexible connection, through the wire 23 to the terminal 16. But since the lever arm 11 is not on this terminal, it will be noted that the current stops at this point. Therefore when the lever arm 11 is in the position shown in Fig. 5, the current can pass through the hoist circuit, and the only time when the current can pass through the telpher circuit is when the lever arm 11 is on the terminal 16.

It will also be noted that if the arm 11 is on the terminal 16, the hoist cannot move in either direction, for the circuit will be open at the terminal *h* if the lever arm is on the terminal 16. Of course, it is self-evident that the switch if turned 90° will reverse the hoisting motor; likewise if the telpher switch is reversed 90°, it will reverse the telpher motor, for it is evident that should the first named switch be reversed 90°, the lever arm which is on the terminal 15, as shown in Fig. 5 will be moved onto the terminal 17. It will also be noted that the copper plate *j* which now connects the terminals *f* and *g* will then connect the terminals *g* and *h*. Likewise the disk *k* will connect *f* and *i*. Thus it will be seen that the direction of the current through the armature has been changed and the motor has thus been reversed. A similar explanation applies to the telpher switch.

The apparatus as a whole operates as follows: We will assume that the first position of the apparatus is as shown at Fig. 1, in which the bucket is down, a load therein and the telpher at the home station with the switch 5 turned to move the telpher to the right when the current is thrown therein, and that the hoisting motor switch is turned so that the bucket will be hoisted. Upon making the contact, which may be done by turning the lever 26 so that the switch 28 will come in contact with the terminal 26^a, the hoist motor will operate to raise the bucket to the position shown in Fig. 2, the stop 21^b comes in contact with the arm 13 and turns the switch to the position shown in Fig. 2, so that the lever arm 11 is on the terminal 16. When in this position, as before described, the telpher motor is cut in and the hoist motor is cut out because the lever 11 is not on either one of the terminals 15 or 17. The telpher is now thrown in and travels to the right towards the position shown in Fig. 3. When the arm 5 strikes the lever 7, the said arm is thrown to the position shown in Fig. 3 and the direction of the current of the telpher will be changed, but as the telpher travels to this position the arm 14 comes in contact with the stop 19 and

the switch is moved to the position shown in Fig. 3 with the lever arm resting on the contact 17. In this position the telpher is cut out because the lever arm 11 is off the contact 16 and the hoist is cut in and the lever 11 resting on the terminal 17 will cause the rope and bucket which may be generally termed the hoist to lower. This figure shows the bucket lowered with the stop 21^a just in contact with the lever 13. The arm 24^a of the catch 24 has come in contact with the stop 27 and releases the bucket so that the bucket is dumped. The bucket continues to be lowered, however, until the lowering apparatus is stopped. As the bucket continues to lower, the stop 21^a being in contact with the arm 13 will throw the switch arm 11 from the contact 17 to the contact 15, as shown in Fig. 4 of the drawing. When the parts are in this position the hoisting motor will be moving to raise the bucket, and the bucket will continue to rise until the stop 21^b comes in contact with the arm 13 when it will move the switch until the lever arm 11 contacts with the terminal 16 and the hoist motor will be cut out and the telpher motor cut in. As the switch of the telpher motor has been reversed, the telpher will now travel to the left and come back to the position shown in Fig. 1, when the telpher switch will be moved to the position shown in said figure. As the telpher comes to this position, the lever 12 comes in contact with the arm 18 whereupon the switch arm 11 is moved off of the contact 16, stopping the telpher and moved to the contact 17, whereupon the hoisting motor is put in operation to lower the bucket and the bucket lowers until the stop 21^a comes in contact with the lever 13, and throws the arm 11 off of the contact 17 to 15, and when the finger 24^a strikes the lever 26, it will move the switch 28 off of the terminal 26^a and entirely cut out or break the circuit so that there is no current passing through any of the wires.

It is understood that the lever 26 is connected to the switch 28 so that they may be moved together.

While we have shown, as before stated, one type of the apparatus for doing the work intended, yet it is to be understood that vari-

ous other types of apparatus may be used without departing from the scope of our invention.

Having now described our invention, what we claim as new and desire to secure by Letters Patent is:

1. In a telpher system, a telpher having a motor, a reversing switch for the telpher motor, stops in the path of the telpher for controlling said switch, a hoisting motor, a hoist operated thereby, a reversing switch for the hoisting motor, means in the path of the hoist for controlling its reversing switch, means operated by said latter switch for starting and stopping the telpher motor, and means in the path of the telpher for starting the hoisting motor.

2. In a telpher system, a telpher having a motor, a reversing switch for said motor, means for operating said reversing switch at the limits of travel of the telpher, a hoisting motor, a hoist operated thereby, a reversing switch therefor, and means for operating said last named switch at the limits of travel of the hoist, said last mentioned reversing switch having an arm for starting and stopping the telpher motor.

3. In a telpher system, a telpher having a motor, a reversing switch therefor, a hoisting motor, a reversing switch therefor, means for operating the switch for the hoisting motor by the movement of the telpher on its track, and means controlled by the switch for the hoisting motor for starting and stopping the telpher motor.

4. In a telpher system, a telpher having a motor, a hoisting apparatus also including a motor, a switch adapted to control the telpher motor in either direction, an additional switch for controlling the hoisting motor, and a switch arm on said last mentioned switch for closing the circuit of the telpher motor.

In witness whereof we have hereunto set our hands at the city, county and State of New York, this sixth day of April, 1905.

HENRY M. HARDING.

CHARLES MARTIN CLARK.

In presence of—

T. RICHARDS,

JOHN J. RANAGAN.