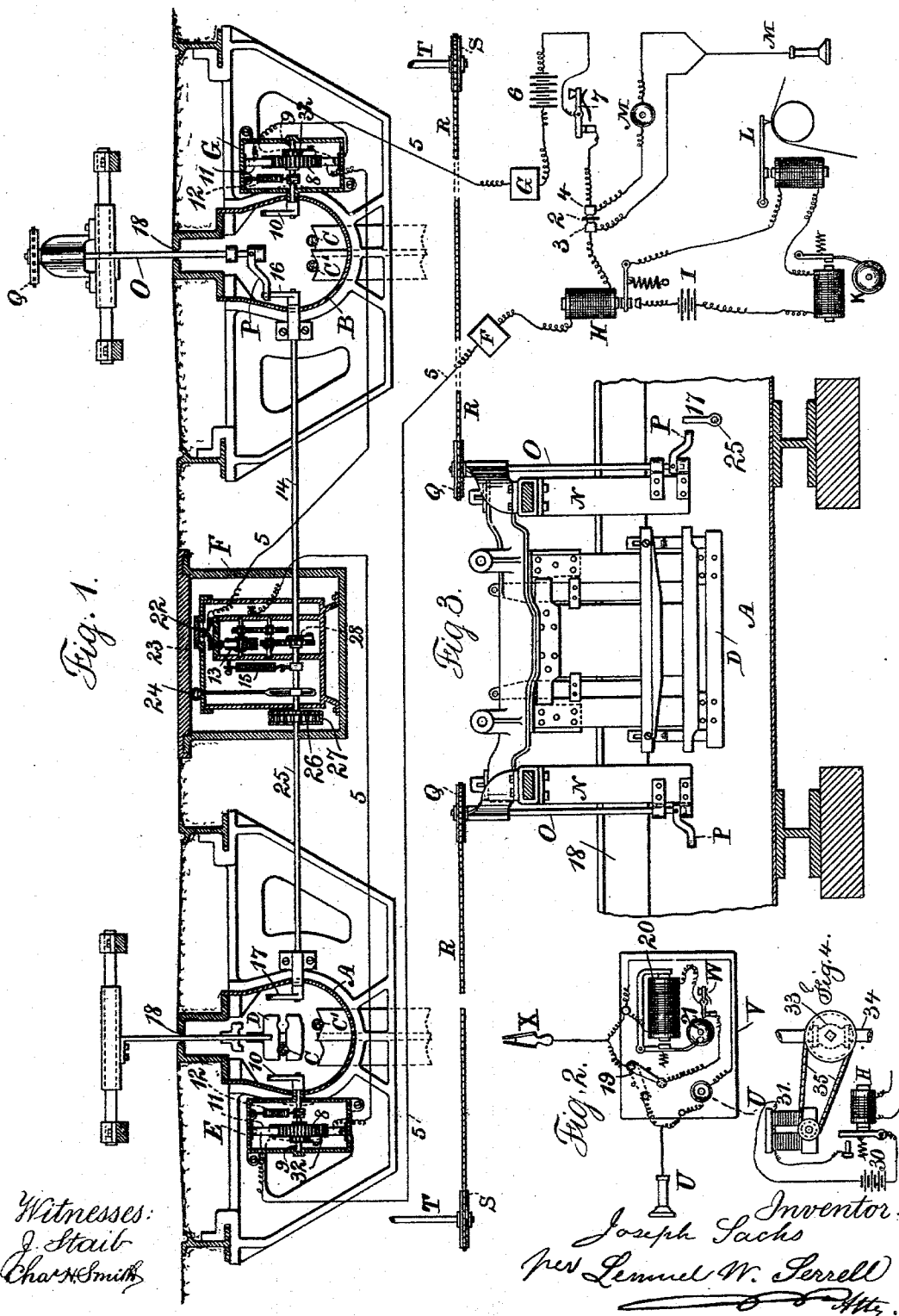


(No Model.)

J. SACHS.
SIGNAL FOR CABLE RAILWAYS.

No. 511,163.

Patented Dec. 19, 1893.



UNITED STATES PATENT OFFICE.

JOSEPH SACHS, OF NEW YORK, N. Y.

SIGNAL FOR CABLE RAILWAYS.

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To all whom it may concern:

Be it known that I, JOSEPH SACHS, a citizen of the United States, residing in the city and State of New York, have invented an Improvement in Signals for Cable Railways, of which the following is a specification.

Cable railways have been provided with electric signals to the power house whereby the conductor or gripman can signal for the stoppage of the engine or the slowing up of the same in cases of necessity, but difficulty has been experienced in giving such signals with the promptness sometimes rendered necessary in cases of accident or failure of the grip to disconnect the car.

In my improvement a signaling box is placed in the conduit or adjacent thereto and a movable device is connected with the car through a plate in the slot rail, which movable device can be brought into contact with an actuating apparatus for the signal box, so that the movement of the car energizes the signal box to send a signal to the power house when the actuating device is moved by the conductor or gripman, and in connection with the signal box I arrange the electric circuits and spring contacts in such a manner that a telephone may be introduced in the electric circuit or signals may be given by hand in addition to the signal sent by the signal box.

In the drawings, Figure 1 is a cross section illustrating the two conduits of a cable railway and indicating the positions in which the signal boxes may be placed. Fig. 2 represents the electric devices that may be carried on the car. Fig. 3 is a section longitudinally of the conduit illustrating the relative position of the grip and the devices for actuating the signal boxes, and Fig. 4 illustrates the device for stopping the engine.

The conduits A and B are of any desired character and the cables are represented at C C', and the grip D is to be of any desired character, and that which is shown in the drawings is only illustrative of a grip, because the present improvement is available with any character of conduit or grip.

In Fig. 1 I have represented three signal boxes E F and G, and these signal boxes and the signaling devices or circuit closing wheels contained in such boxes may be of any de-

sired character. The boxes E and G are represented as within the conduit and preferably at or near manholes, and the box F is represented as between the tracks so as to be actuated from either of the conduits; and it is to be understood that these boxes are to be placed at suitable distances apart along the line of the cable railway, but for convenience of illustration they are represented as in line with each other transversely of the railway.

Signal boxes are well known in fire alarm systems and the movement of the circuit closing wheel or segment is employed to open and close the electric circuit and give the prescribed signal at the distant station. In this instance the electric conductors are to run to the power house, and at H a relay magnet is presented to a local circuit containing a battery I and a sounder or gong K, and there may also be a register of any suitable character, as illustrated at L, to note down the signal sent in and the time at which such signal is sent, if desired, registers of this character being well known in the market, and I prefer to make use at the power house of a telephone M that is normally connected in the main line circuit, and when the plug 2 is introduced between the electrodes 3 and 4 the telephone M is short circuited, and when such plug is drawn out the telephone is included in the main line circuit; and it will be evident by the diagrammatic representation of the wires 5 of the main circuit, the battery 6 and the switch 7, that any desired number of signal boxes E F or G may be included in the main line circuit and that when a signal is sent by either box the relay magnet will be actuated and the gong sounded in the local circuit corresponding to the pulsations given upon the main line by the circuit closing wheels or similar devices in the respective signal boxes.

As before mentioned, it is to be understood that the signaling devices in the respective boxes may be of any desired character; I have however represented in the signal boxes E and G wheels or sectors 8 on the shafts 9 that are provided with crank arms 10 on their outer ends, and the wheels or sectors 8 are provided with insulating and conducting ma-

terial alternately upon the edge or periphery thereof for opening and closing the main circuit through the springs 11, and it is advantageous to employ a spring or weight 12 that is wound up or elevated by acting upon the crank arm 10, and by its descent or recoil the circuit closing wheel or sector is moved, there usually being a ratchet and pawl connection 32 between the shaft 9 and the wheel or sector 8 so that the shaft is freely moved in one direction without moving the wheel or sector, and the ratchet or pawl causes a movement of the wheel or sector in the other direction when the shaft is free to be returned by the spring or weight to a normal position. In the central box F the circuit closing wheel 13 is actuated by the cross rock shafts 14 and 25 and a weight or spring 15 with intermediate ratchet wheel and pawl 28 and gearing between the shaft 14 and the circuit wheel 13, and there are crank arms 16 and 17 on the respective ends of the cross shafts 14, and one crank arm being in one conduit and the other crank arm in the other conduit, so that when either arm is acted upon the spring 15 will be strained or the weight raised, and this spring or weight when the rock shafts are liberated will return the rock shafts to their normal position and rotate the circuit closing wheel 13 and send a signal over the electric circuit to the power house.

In order to actuate the crank arm 10, 16 or 17, any suitable device may be made use of that is connected with the car that is propelled by the cable. I have represented plates N as extending down through the track slot 18 and supporting the shafts O which are provided with arms P that can be swung around horizontally so as to be in the path of either the arm 10, 16 or 17, and by the movement of the car the arm P will give to the arm 10, 16 or 17 the necessary motion to actuate the signal box.

It is advantageous to provide upon the upper ends of the shaft O sprocket wheels Q and chains R to the sprocket wheels S upon the vertical shafts T at the respective ends of the car, and which vertical shafts T can be actuated by the conductor or gripman so as to turn or move the arms P either in one direction or the other to bring the arm into the proper position for acting upon the arm and rock shaft of the signal box.

It is advantageous to provide with each car a telephone U connected with a movable board V which also carries a switch 19, and electro-magnet 20, and a bell 21 that can be rung by the armature of the electro-magnet and a finger key W, and the circuit wires can be arranged in the manner represented and a flexible conductor provided with a contact wedge X to be inserted between the spring contacts 22 that are provided in the electric circuit that passes through the box F so that when this wedge X is put in between the springs 22 the circuit is closed through the contact wedge X, and when the switch 19 is in one

position the circuit is closed through the finger key W and magnet 20 so that such magnet and the bell can be used for receiving a signal from the power house, or the finger key W can be used in sending a signal to the power house, the magnet 20 and bell 21 responding to the movements of the finger key and showing the circuit to be in order, and when the switch 19 is moved into the position shown by dotted lines the magnet 20 is cut out and the telephone U brought into the circuit. It is to be understood that this board V and the appliances therewith connected can be easily carried in each car and can be made use of at one of the signal boxes F, because such signal box F is provided with a movable cover 23 by lifting which access is given for the insertion of the contact wedge X between the springs 22, or if desired, a pull 24 can be provided in the signal box F as in ordinary fire alarm signal boxes by the actuation of which pull 24 the signal can be given to the central station by the rotation of the circuit wheel in such signal box F.

It will now be apparent that by the devices herein described a signal can be sent to the power house from the moving car and communication can be given in addition through the signal box F by a finger key or by a telephone, and also the conductor or gripman can give a signal by the circuit closing wheel of the signal box F by the hand pull 24 after the cover 23 has been raised.

Where the signal box is placed between the tracks, such signal box is available with both tracks and can be actuated from a car on either track and in many places it may be preferable to employ only the signal boxes between the tracks, or the signal boxes E or G alone may be made use of within the trench and preferably adjacent to or at the man-holes in the respective tracks.

It is advantageous to employ metallic circuit connections without ground connections in signals of this character, and the circuit connections may be made so as to include any desired number of signal boxes.

In cases where the signal box F is to be actuated from both tracks, it is advantageous to have two shafts 14 and 25 in the same plane extending from the respective conduits and connected together by two gears 26 and 27, so that the direction of motion given to the circuit closing wheels may be the same when the parts are actuated from either one track or the other.

Where it is desirable to give two different signals to the power house, the boxes E and G can be adapted to sending one character of signal and the box F another character of signal; for instance, the boxes E and G may give a signal indicating that the engine is to be slowed, and the box F that the engine is to be stopped, and either one box or the other can be actuated according to the direction in which the arm P on the car is moved.

In some instances it becomes important to stop the engine without waiting for the engineer to shut off the steam. In this case I provide a local circuit and a battery 30 adapted to run the motor 31, and this is brought into action by the relay magnet H, as represented in Fig. 4, such battery and local circuit being connected through the same armature of the relay magnet H that is shown in Fig. 1, and from the shaft of the motor armature a motion is communicated to the throttle valve 33 in the steam pipe 34, preferably by sprocket wheels and a chain 35, so that when the electric circuit is broken anywhere upon the line and the armature of the relay magnet H flies back, the motor is brought into action and closes the throttle valve to stop the engine.

I do not limit myself to any particular character of signaling mechanism actuated from the car, as the signaling devices may be magnetic and similar to those used in the call box of a telephone.

I claim as my invention—

1. The combination with the conduit in a cable railway, of signal boxes having movable circuit controlling devices and mechanical appliances connected to and moving with the cable and car and capable of being brought into action for moving the circuit controlling devices in the signal box, and a signal at the power house, substantially as set forth.

2. A signal box having circuit controlling devices, a rock shaft and an arm outside the signal box, in combination with a cable railway and car and a connection extending down from the car through the slot rail and an arm carried by such connection, and mechanism upon the car for moving the arm to bring the same into the path of the arm upon the rock shaft and actuate the signal box by the motion of the cable, substantially as set forth.

3. The combination with the cable in a cable railway and the electric circuit connections extending to the power house signal, of a signal box and its circuit controlling devices, a car and the cable grip and mechanism for actuating such circuit controlling devices by the motion of the cable, a telephone

and a movable plug for the circuit extending to the power house, substantially as set forth.

4. The combination with the cable in a cable railway and the electric circuit connections extending to the power house, of a signal box and its circuit controlling devices, a car and the cable grip and mechanism for actuating such circuit controlling devices from the motion of the cable, contacts in the electric circuit extending to the power house, a movable plug and circuit connections and a telephone, an electro-magnet and bell, and a finger-key and switch connected with the movable circuit wires, whereby a signal can be sent to the power house or received from the same or the telephone made use of on the car, substantially as set forth.

5. The combination with the cable and a vehicle moved by the cable, of electric signal boxes adjacent to the track, mechanism such as a movable arm upon the car adapted to be so placed as to bring into action the signal box by the movement of the cable and car, and an electric circuit and apparatus at the central station for receiving the signal, substantially as set forth.

6. The combination with a cable railway and a vehicle moved thereon and circuit connections to the power house, of two signal boxes adjacent to the track on which the vehicle runs and adapted to send two different signals, and means upon the car for bringing either of the two boxes into action for transmitting its signals to the central station, substantially as set forth.

7. The combination with a vehicle and a cable for moving the same, of signal boxes adjacent to the cable, an electric circuit connecting the signal boxes with the central station and devices that can be actuated from either end of the car for operating the signal boxes by the movement of the cable and car, substantially as set forth.

Signed by me this 3d day of August, 1893.

JOSEPH SACHS.

Witnesses:

GEO. T. PINCKNEY,

A. M. OLIVER.