

C. ADLER, JR.
ELECTRICALLY OPERATED VEHICLE BRAKE.
APPLICATION FILED JUNE 16, 1917.

1,300,094.

Patented Apr. 8, 1919.
2 SHEETS—SHEET 1.

Fig. 1.

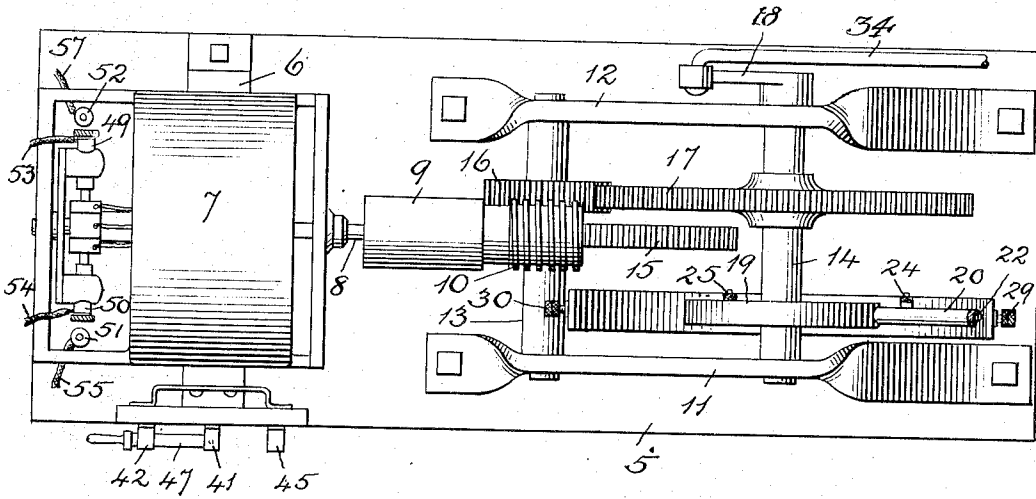
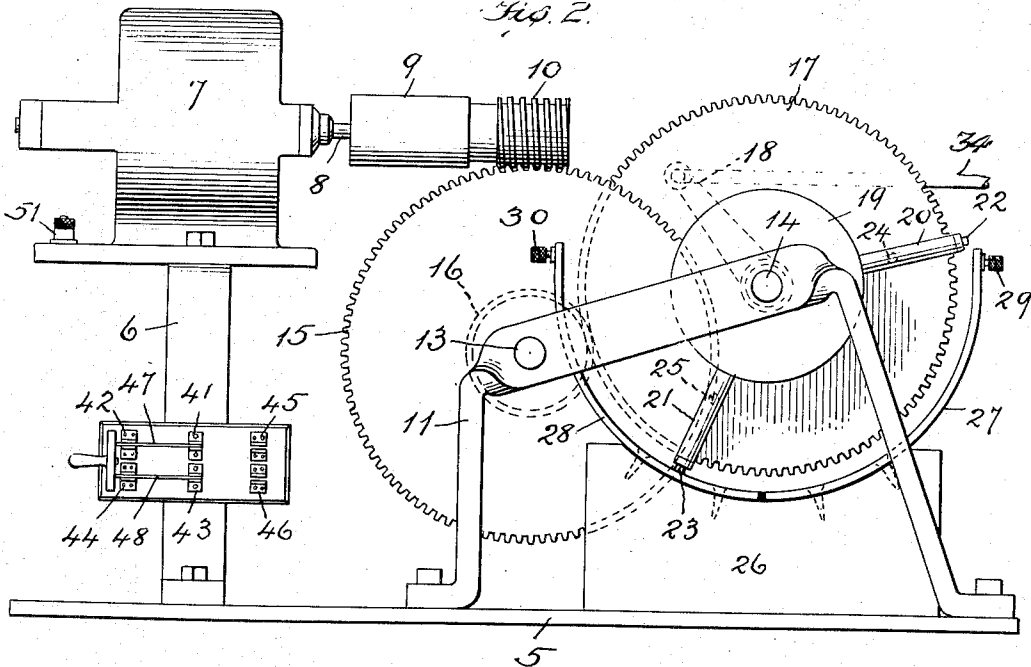


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

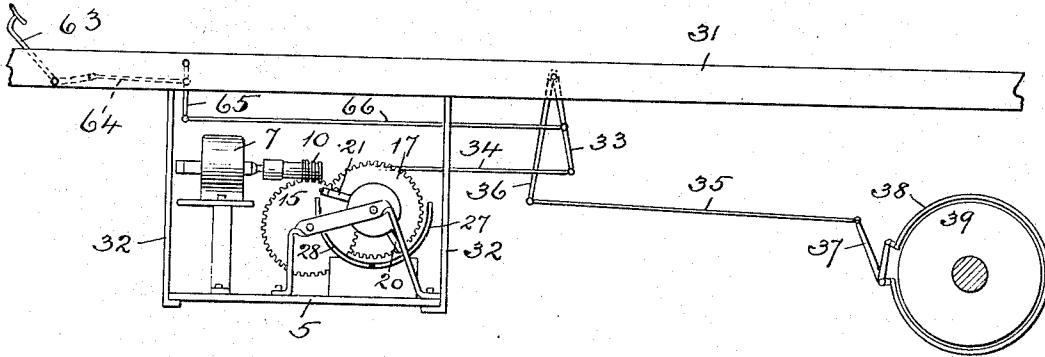
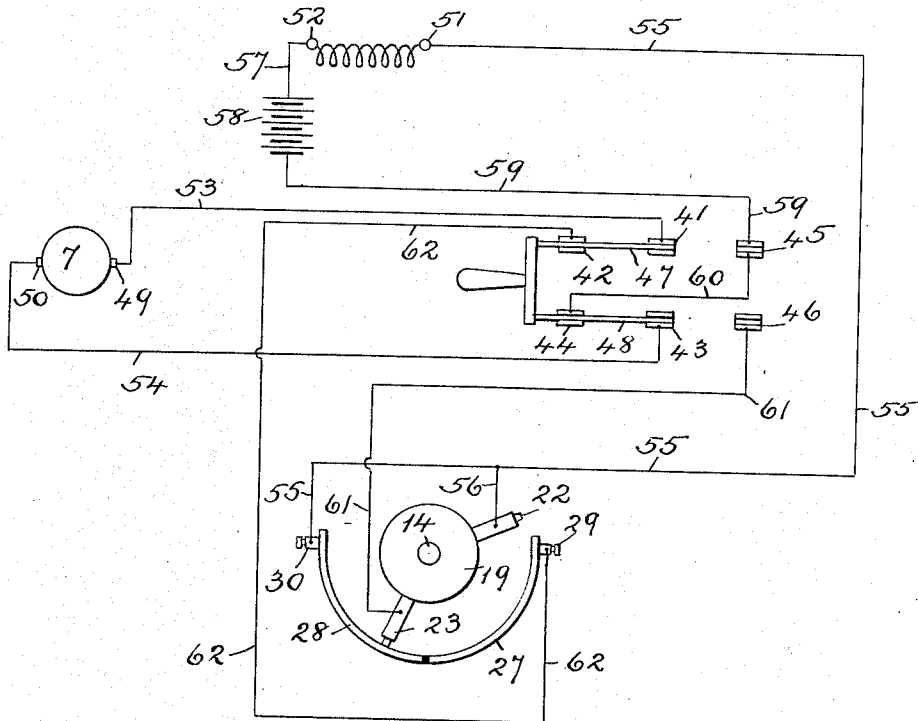


Fig. 1.



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UNITED STATES PATENT OFFICE.

CHARLES ADLER, JR., OF BALTIMORE, MARYLAND.

ELECTRICALLY-OPERATED VEHICLE-BRAKE.

1,300,094.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CHARLES ADLER, JR., a citizen of the United States, residing at Baltimore, in the State of Maryland, have
5 invented certain new and useful Improvements in Electrically-Operated Vehicle-Brakes, of which the following is a specification.

This invention relates to improvements in electrically-actuated brakes for vehicles, and is especially designed for use on motor-vehicles so that the application and release of the brakes may be readily effected by the operation of an electric switch.

One object of the invention is to provide an improved motor-driven mechanism for effecting an operation of the brake devices and to provide an improved means for automatically controlling the motor whereby to stop the same when the mechanism has been moved to an extreme application position or to a full release position.

The invention is illustrated in the accompanying drawings, wherein,—

Figure 1, shows the improved driving mechanism in top plan.

Fig. 2, illustrates the same in side elevation.

Fig. 3, diagrammatically illustrates the device and its application to a car, and

Fig. 4, illustrates a wiring diagram showing the connections between the current supply, motor, switch and automatic cut-out device.

Referring to the drawing by numerals which designate the various parts; 5, indicates a support or base on which the driving mechanism is mounted and from which a bracket 6, extends vertically and sustains a motor 7. The motor has a shaft 8, with an enlarged body 9, at the outer end thereof and a worm screw 10, is formed on said body.

To one side of the motor the base carries two bearing brackets 11, and 12, respectively which sustain horizontal shafts 13 and 14, and shaft 13, carries a gear 15, which has position directly under and meshes with the worm screw 10, so as to be driven by the latter. A pinion 16, is also carried on the shaft 13, and meshes with and drives a large gear 17, on the shaft 14.

Shaft 14, is provided at one end with a crank arm 18, and also carries a circular head 19, of some material that is a non-conductor of electricity. The worm drive

and the arrangement of gearing is such that shaft 14, will be driven at a comparatively low rate of speed, and as will presently be pointed out makes only a partial revolution. 60

The circular head 19, carries two radially-extending tubes 20 and 21, which have contact devices or brushes 22, and 23, projecting therefrom. The tube 20, also has a binding post 24, while tube 21, is provided with a binding post 25. 65

Below the shaft 14, and directly beneath the head 19, there is a block 26, of insulating material having a concave upper side and on this concave side are two curved contact plates 27 and 28, which are insulated from each other. The plate 27, is provided with a binding post 29, while plate 28, has a binding post 30. These curved contact plates 27, and 28, extend in a direction that is concentric with the head 19, so that as the contacts or brushes 22 and 23, swing, when the head is rotated, they will rub over said curved plates and maintain contact therewith until the end of the plate is reached, whereupon 80 the contact will be broken, as will presently be explained.

In practice the base 5, on which the above-described mechanism is mounted, is hung from the frame 31, by brackets 32, or otherwise, and the arm or lever 18, on the end of shaft 14, is connected to an arm 33, of a bell-crank lever by means of a connecting device 34, preferably of a flexible character, such as a wire, chain or rope. Another flexible connection 35, extends between the other arm 36, of the bell-crank lever and the brake-band actuating lever 37,—the band 38, extending around a drum 39, in the usual or any preferred manner, all as illustrated in 95 Fig. 3, of the drawing.

In carrying out the invention I utilize an electric switch device which may be placed anywhere within reach of the driver,—the location however depending upon the kind 100 of vehicle on which the apparatus is put.

In the present illustration this switch has a set of contact points 41, and 42, another set of contact points, 43 and 44, and a third set of contact points 45 and 46, together with 105 a knife-blade switch with blades 47 and 48, that are pivoted to the contacts 41 and 43, and may be swung into engagement with the contacts 42 and 44, or the contacts 45 and 46, according to the direction it is desired the 110 motor shall revolve. The motor is designed to be operated in either direction so as to

revolve the train of gears in one direction to apply the brakes, and in a reverse direction to release the brakes.

The motor is provided with four binding posts which are designated 49, 50, 51 and 52, respectively. The post 49, has a wire connection 53, that leads to and connects with contact 41, on the switch while post 50, is connected by a wire 54, with the contact 43, of the switch.

Posts 51 and 52, are connected through the field of the motor and from post 51, a wire 55, is run to the binding post 30, on the curved contact plate 28, while a branch 56, from said wire connects with the contact brush 22. Post 52, of the motor has a wire connection 57, that leads to and connects with one side of a battery 58, and a wire 59, connects the other side of the battery with the contact 45, of the switch. A bridge wire 60, connects switch contacts 45 and 44.

A wire 61, connects switch contact 46, with the movable brush 23, and a wire 62, connects the switch contact 42, with the binding post 29, of the curved contact plate 27.

The position of the parts in Figs. 1, 2 and 4, are as when the brake is applied, while in Fig. 3, the parts have the position they assume when the brake is released.

The position of the switch and contact brushes in the diagrammatic view of Fig. 4, is therefore such as is assumed when the brake is applied, but as will be pointed out, the parts in said Fig. 4, are so located that the motor has done its work and is idle with the brake applied.

By referring to Fig. 4, it will be noted that the contact brush 22, has moved beyond and out of contact with the curved plate 27. This condition effects an interruption in the circuit that drives the motor in a direction to apply the brake and this interruption or break in the circuit takes place automatically by the rotation of shaft 14, and head 19, and entirely independent of any operation of the hand switch by the operator or driver.

It will therefore be understood that the movable brush 22, acts as an automatic cut-out to stop the motor traveling in one direction, and that the movable brush 23, performs a similar operation to stop the motor during its travel in a reverse direction. The direction of travel however is not determined alone by either brush 22 or 23, but with one or the other of those brushes together with the hand switch device and the contacts of the latter.

For example before the knife switch is turned to close connections between contacts 41 and 42 and between contacts 43 and 44, the brush 22, will be near the lower end of contact plate 27, and the brush 23, will, at that time, be located above the upper end of the contact plate 28, as illustrated in Fig. 3, of the drawing. When in this position, and

it is desired to apply the brake the hand switch will, as before stated, be turned to close the contacts 41, 42 and 43, 44, whereupon the circuit would be as follows: from battery 58, by wire 59, to contact 45; across bridge-wire 60, to contact 44; then through blade 48, to contact 43; then by wire 54, to post 50, to drive motor 7; then by post 49, and wire 53, to and through contact 41, blade 47, to contact 42; then by wire 62, to post 29, and contact plate 27; then from plate 27, through brush 22, (which at the time will be at lower end of plate 27); then by wires 56, 55 to post 51, through field of motor to post 52, and finally by wire 57, back to current supply or battery, and by thus completing the circuit, drive the motor until the circuit is broken. This break automatically takes place when the brush 22, leaves the curved plate 27, and the motor will stop, holding the brake applied.

To reverse the motor and release the brake the switch will be swung over so as to close connections between contacts 41, 45, and 43, 46 whereupon the reverse circuit will be completed and the motor operated to release the brake. This movement will then continue until brush 23, leaves contact plate 28.

It will thus be seen that the motor will be started by the operation of the hand switch but will be automatically cut out by a break in the circuit, effected by either the brush 22 or the brush 23, so that if the brake is to be fully applied or fully released the operator need do nothing other than start the motor.

When it is desired to simply check the speed by a series of application and release operations, this can be readily effected by the operator simply swinging the switch blades from one side to another and making brief contacts with the contacts 45, 46 on one side and then with the contacts 42, 44 on the other side.

I prefer to maintain the foot brake mechanism so the brake can be operated by foot power, in which instance the brake lever 63, has a connection 64, with a swinging lever 65, and a flexible connection 66, is provided between the lever 65, and the arm 33, of the bell-crank lever.

Having described my invention what I claim is,—

1. In an electric brake device for vehicles, the combination with brake-lever devices, of a reversible electric motor; connections between the motor and brake-levers; a switch having two sets of contacts; a circuit-breaker having two circuit-breaking devices—one for establishing a circuit to drive the motor in one direction and the other for establishing a circuit to drive the motor in a reverse direction and both circuit-breaking devices being independent of the switch; a circuit including the motor, the switch and one circuit-breaking device at a

time, and rotating means carrying the circuit-breaking devices.

2. In an electric brake device for vehicles, the combination with brake-lever devices, of a reversible motor; connections between the motor and brake-lever devices; a manually operated switch having contacts to effect an operation of the motor in one direction and other contacts to cause an operation of the motor in a reverse direction; a circuit-breaker comprising two electrically-separated curved contact plates and two electrically separated contact devices; means for imparting movement to the two contact devices of the circuit breaker while the motor is operating, and a circuit including the motor one set of switch contacts at a time and the said circuit breaker.

3. In an electric brake device for vehicles, the combination with brake-lever devices, of a reversible electric motor; means operated by the motor for actuating the brake-lever devices; a manually-operated switch; two electrically separated curved contact plates; two electrically separated contact devices each having movable contact with a curved contact plate and one for completing a circuit to drive the motor in one direction

while the other completes a circuit for driving the motor in a reverse direction; means for moving both contact devices as the motor operates, and a circuit including the motor, the switch and one of said contact and curved plates at a time.

4. In an electric brake device for vehicles, the combination with brake-lever devices, of an electric motor; a train of gears operated by said motor; means between the gears and brake-levers for actuating the latter; a circuit-breaker having two movable contacts and two stationary contacts; means for moving the movable contacts of the circuit-breaker as the motor revolves; a manually-operated switch, and a circuit including the motor, the manually operated switch, one movable contact and one stationary contact of the circuit-breaker at a time, said movable contact of the circuit-breaker breaking the circuit upon passing from the stationary contact.

In testimony whereof I affix my signature in the presence of two witnesses.

CHARLES ADLER, JR.

Witnesses:

MALCOLM W. LOWENSTEIN,
CHAS. B. MANN.