

and an electric motor, the armature shaft of which is mechanically connected with the said driving wheels by suitable gearing, and which is supported upon the axle thereof in positive relation thereto. 2nd. An electric locomotive, comprising a platform or vehicle, a pair of centrally-located driving wheels, an electric motor supported in a normally vertical position upon the axle of said driving wheels, and positive mechanical connections between the armature shaft of the motor and the axle of the driving wheels. 3rd. An electric locomotive, comprising a car or platform, a single pair of centrally-located driving wheels, the motor located above the driving wheels, an elongated box or bearing upon the driving axle, and supports extending between the said box and the frame of the motor. 4th. An electric locomotive, comprising a car or platform, a single pair of centrally-located driving wheels, spring bearings between the platform and the extremities of the driving axle, a motor supported upon the axle of the driving wheels, and spring connections between the frame of the motor and the platform of the car. 5th. An electric locomotive, comprising a car or platform and a centrally-located pair of driving wheels, a pair of auxiliary supporting wheels under the front and rear portions thereof, and pivotal connections between the auxiliary supporting wheels and the axis of the driving wheels, whereby free lateral movement is permitted to the ends of the platform. 6th. In an electric locomotive, the combination of the car or platform A, centrally-located driving wheels, metallic frames K connected to the axles thereof and pivotally attached at the centre of the vehicle, auxiliary supporting wheels secured to the extremities of the frame K, and upwardly acting springs carried by the axles of the auxiliary wheels between the axles of the auxiliary wheels and the ends of the platform. 7th. The combination of a platform A, centrally-located driving wheels, supporting wheels J, J, pivoted connecting frames K and the lateral springs M. 8th. The combination of the platform A, the central driving-wheels, the auxiliary supporting wheels J, J, and pivoted connecting frames K, K, and the lateral springs M and guard-chains N. 9th. The combination of the platform A, centrally-located driving wheels B, B, supporting wheels J, J, rotatably mounted upon axles *j, j*, and frames K rigidly secured to said axles and pivotally connected at the central point of the platform A. 10th. The combination of the platform of a car and centrally-located driving wheels thereunder, supporting wheels sustaining the end portions thereof, and pivotally connected to the center of said platform and attached to axles *j*, tracks located above the auxiliary supporting wheels, and devices extending upward from the axles thereof and resting against said tracks, and laterally-acting springs secured to the platform and to the auxiliary wheels, whereby said wheels are normally retained in central positions beneath the platform. 11th. The combination of the platform A, having centrally-located driving wheels, supporting wheels J, J, connecting arms K pivotally connected at the centre of the platform and rigidly attached to axles *j*, supporting the wheels J, supporting plates *k* located above said axles *j* and provided with extensions *m*, vertically-acting springs L mounted upon said plates, and laterally-acting springs M attached to the extensions *m*.

No. 32,005. Electro-Dynamic Motor.

(*Moteur électro-dynamique.*)

Charles J. Van Depoele, Lynn, Mass., U. S., 3rd December, 1889; 10 years.

Claim.—1st. In an electric motor, the combination, with the armature thereof, of a long field magnet coil in series therewith, an adjustable resistance and means for placing any desired portion of the resistance either in series or in shunt relation to the coils of the field magnet. 2nd. In an electric motor, the combination, with the armature thereof, of a long series field magnet coil, an adjustable resistance adapted to be connected in series therewith at starting, and means for placing said resistance or any desired portion thereof in derivation from the field magnet coils. 3rd. In an electric motor, the combination, with the armature thereof, of a long series field magnet coil, an adjustable resistance adapted to be connected in series therewith at starting, means for placing said resistance or any desired portion thereof in derivation from the field magnet coils, an opposing or differential coil or coils upon the field magnet, and series connections between the differential coil or coils, and the resistance, when in shunt relation with the field magnet. 4th. In an electric motor, the combination, with the armature, of a long field magnet coil in series therewith, an adjustable resistance, a switch, connections between the coils of the field magnets and the resistance and the switch, and means for placing the resistance in series or in shunt relation to the field magnet coils, or in shunt relation to the field magnet coils, or cutting it out entirely, to regulate the power and speed of the motor. 5th. In an electric motor, the combination, with the armature, of a long series field coil and an adjustable artificial resistance, a switch and connections between the switch and the several portions of the resistance, said switch being so arranged that the resistance can be placed either in series or in derivation from the main field magnet coils of the motor. 6th. In an electric motor, the combination, with the armature, of field magnet coils, an adjustable resistance, a switch connections between the field magnet coils and the coils of the resistance and the said switch, and a switch lever adapted to be moved into successive engagement with the several parts of the switch, and to thereby connect the field magnet coils and resistance in series, then gradually cut out the resistance, then connect the said resistance in derivations over the field magnet circuit, and then gradually cut out the shunted resistance, or *vice versa*. 7th. In an electric motor, the combination, with the armature of a field magnet coil in series therewith, an adjustable resistance, a switch, connections between the coils of the field magnet and of the resistance and the switch, and a switch lever adapted to be moved into engagement with the several parts of the switch and in one rotation to connect the resistance in series with the field magnet coils, then to gradually cut it out, then to connect the entire resistance in derivation from the said field magnet coils and cut it out altogether. 8th. The combination, with a series field magnet and a divided artificial resistance, of a switch having an extended terminal connected to one

end of the field magnet coil, a number of contact points connected to terminals arranged along the resistance, an extended return connection, a short segmental contact, a conductor extending from the beginning of the field magnet to said contact, and a movable contact arm provided with contacts adapted to engage the several parts of the switch and to connect the resistance in series or in derivation with the field magnet coils, substantially as described.

No. 33,006. Multiple Motor Electric Locomotive. (*Locomotive électrique à moteur multiple.*)

Charles J. Van Depoele, Lynn, Mass., U. S., 3rd December, 1889; 10 years.

Claim.—1st. An electrically propelled vehicle, provided with sets of driving wheels, rigid upon their axles, electric motors mounted upon said axles and radially movable thereon, driving gears upon the axles, driving pinions upon the armature shafts of the motors in connection with the driving gears upon the axles, and buffer springs for limiting the oscillations of the free ends of the motors. 2nd. An electrically propelled vehicle, provided with one or more sets of driving wheels rigidly secured upon their axles, electric motors vertically journaled upon said axles and extending upwardly therefrom, driving gears upon the axles, driving pinions upon the armature shafts of the motors in mesh with the driving gears upon the axles, and buffer springs and connections upon the upper ends of the motors. 3rd. In an electrically propelled vehicle, a plurality of sets of driving wheels mounted rigidly upon transverse axles, electric motors journaled upon and radially movable upon said axles, driving gears upon the axles, and driving pinions upon the armature shafts of the motors in mesh with the driving gears upon the axles, a longitudinally rigid connection between the free extremities of the motors, a rigid or stationary brace or support connected to the axles and formed with an upward extension for guiding the connection extending between the motors, and buffer springs bearing against the upward projection of the brace and attached to the connection uniting the free ends of the motors. 4th. In an electrically propelled vehicle, two sets of driving wheels, electric motors journaled upon the axles thereof and radially movable thereof, driving gears upon the axles to be driven, and driving pinions upon the armatures of the motors in mesh with the said driving gears, a brace or support extending between and journaled at its extremities upon the driving axles and extending upwardly between the free ends of the motors, a longitudinally rigid connection attached to the free ends of the motor and passing through and guided between the upwardly extending support and buffer springs secured to the support and to the motor connection. 5th. In an electrically propelled vehicle, the combination, with the driving axle, a motor supported thereon and radially movable with respect thereto, a driving gear upon the axle and a driving pinion upon the armature shaft of the motor in mesh with the driving gear, and a supporting link journaled upon the armature shaft at one end and upon the driving axle at the other.

No. 33,007. Nut Lock. (*Arrête-écrou.*)

David Steiner, Adamsburg, Penn., U. S., 3rd December, 1889; 5 years.

Claim.—The combination, with a pair of nuts and a locking slide placed between the nuts and held from lateral displacement thereby, of a locking bolt passed beneath the said nuts and engaging with the locking slide, substantially as and for the purpose described.

No. 33,008. Operation of Long-Line Telegraph Circuits. (*Opération des circuits des lignes télégraphiques longues.*)

David H. Keeley, Ottawa, Ont., 3rd December, 1889; 5 years.

Claim.—1st. The method herein described of transmitting telegraphic signals, which consists in transmitting over a line positive and negative impulses alternately, and in neutralizing or augmenting the effects of the same by presenting to line at the receiving station a rapidly reversing current. 2nd. In a telegraphic system, a pole changing transmitter in combination with a rapidly acting current reverser at the receiving station, for either neutralizing or augmenting the impulses transmitted. 3rd. In a telegraphic system, a pole changing transmitter, in combination with a receiving apparatus, consisting of a polarized relay and a rapidly acting current reverser, whereby the transmitted impulses are either neutralized or augmented. 4th. In a telegraphic system, a main line, including the primary of an induction coil, a relay included in the secondary of said coil, in combination with a pole changer operating to open and close said secondary circuit, and to effect its closure before the introduction of a current into, and its opening before the withdrawal of a current from the said primary, whereby the movements of the relay in long circuits are accelerated. 5th. An automatic circuit breaker, comprising two polarized electro-magnets and two batteries with circuits and contacts, arranged so that the movement of an armature of one magnet effects a reversal of current in the other magnet, one of the armatures being arranged to make and break a separate circuit. 6th. In duplex telegraphy, the combination, with the main line, of a current reverser located in a derived circuit to the main line, and operating in the manner and for the purpose set forth. 7th. In a telegraph system, with double key transmission, the arrangement and connections of two transmitting keys operating when depressed to send and currents respectively to line and in the act of their uprival to send weaker reverse currents momentarily to line, in combination with a receiving apparatus, consisting of a galvanometer or syphon recorder and a rapidly acting current reverser, whereby the discharge currents are neutralized and the movements of the receiving instrument are accelerated.