(No Model.)

H. R. MacLEAN & G. A. KORNETZKE.

ELECTRIC RAILWAY.

No. 538,786. Patented May 7, 1895.

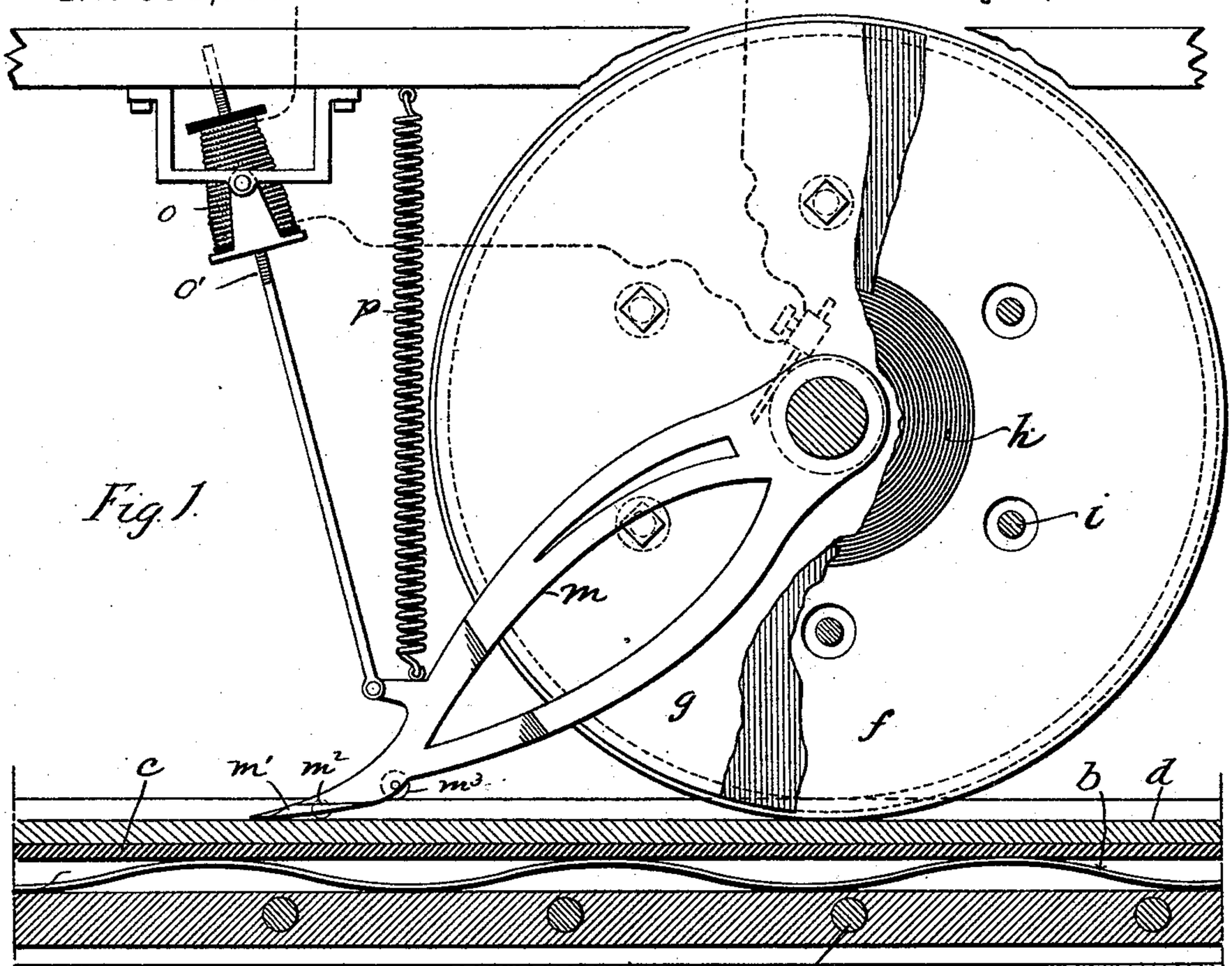

Fig. 1.

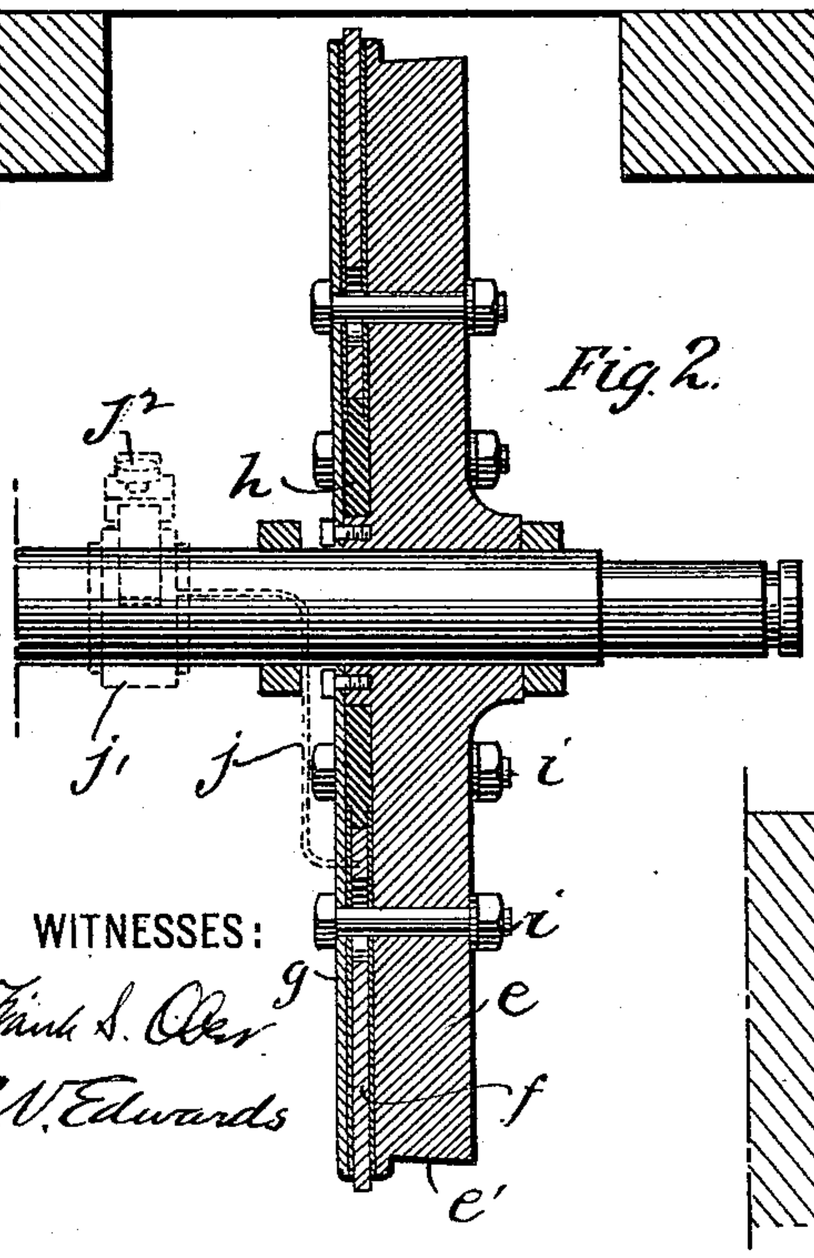

Fig. 2.

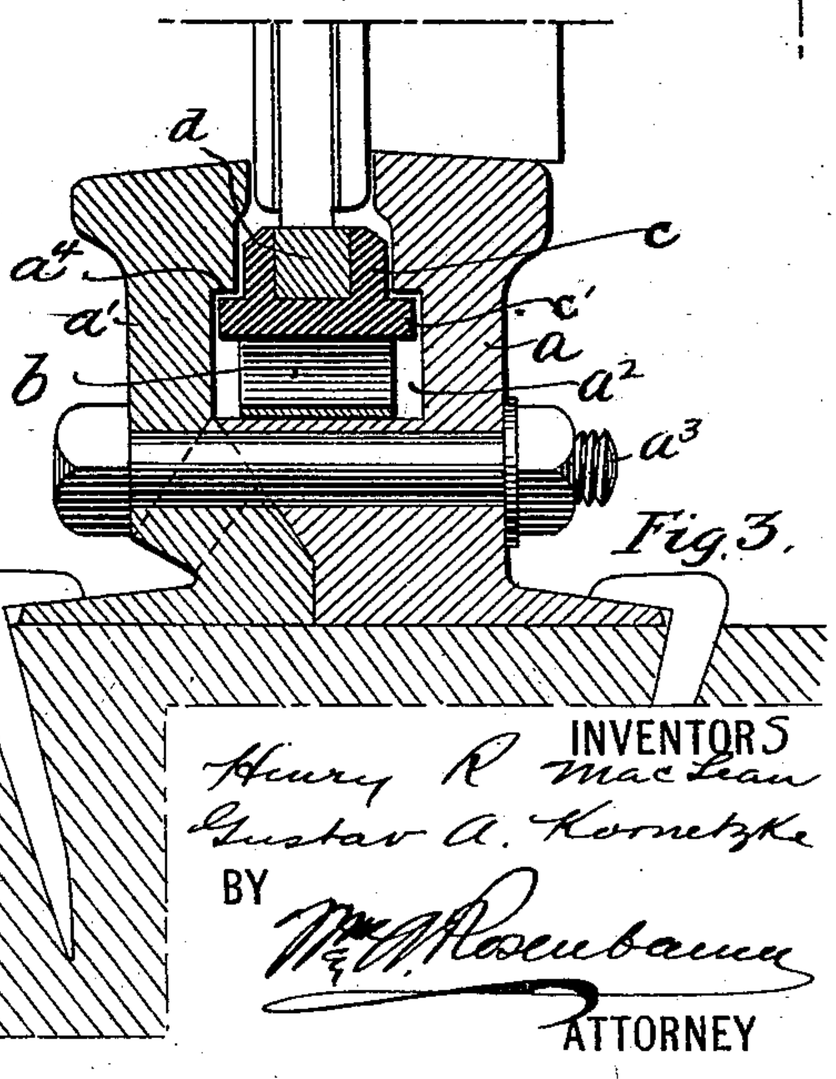

Fig. 3.

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ELECTRIC RAILWAY.

SPECIFICATION forming part of Letters Patent No. 538,786, dated May 7, 1895.

Application filed August 3, 1894. Serial No. 519,335. (No model.)

To all whom it may concern:

Be it known that we, HENRY RUTGERS MACLEAN and GUSTAV ADOLF KORNETZKE, citizens of the United States, residing at Schenectady, in the county of Schenectady and State of New York, have invented certain new and useful Improvements in Electric Railways, of which the following is a full, clear, and exact description.

This invention relates to electric railways, and has special reference to the conduit system of railways in which the electric conductor is located in a trough formed in or adjacent to one of the rails upon which the vehicles travel.

Among the objects of the invention may be mentioned efficiency in operation and simple and economical construction.

The invention consists of the apparatus and combinations thereof, hereinafter described and pointed out in the claims.

In the accompanying drawings, Figure 1 represents a side elevation of a portion of a vehicle and the road-bed, with parts broken away to clearly illustrate our invention. Fig. 2 is a central section of the car-wheel used by us. Fig. 3 is a transverse section of the track or conduit, showing a portion of the wheel of the car.

Referring to the drawings by letter, a, a', respectively represent two parts of which one of the rails upon which the vehicles travel is formed. These parts are so formed that when together there is a longitudinal space or conduit, a^2, between them, and they are held together by suitable bolts, a^3, placed at intervals throughout the length of the track. Within the conduit and upon the bottom thereof, is located a fluted or serpentine ribbon spring, b, which will be practically continuous throughout the system. Upon this spring rests freely a holder, c, of insulating material having the general shape of a trough and provided with flanges c', which are adapted to impinge against shoulders a^4 formed in the conduit to limit the upward movement of the holder caused by the spring. In the trough or groove of the holder is placed a copper conductor, d, which conveys the current from the generating station to the vehicles running upon the track. The upper surface of this conductor is located sufficiently below the upper surface of the rail to prevent contact with it by wagons, persons or animals moving upon the street.

One of the wheels of the vehicles will be provided with contact devices which will now be described. Such a wheel is represented by E, and it consists of a main portion e, upon which the ordinary tread, e', is formed; also a flange of peculiar construction. When the vehicle is running properly upon the tracks the tread e' of the wheel E runs upon the upper surface of the part a of the rail, hereinbefore described, while the flange projects into the conduit a^2 formed in the rail. Against the inner face of the wheel are placed two disks, one f, of copper and the other g, of steel or other strong material. The copper disk is confined between the wheel and the steel disk, but it is of greater external diameter, so that it will project slightly beyond the steel disk all around the wheel. Both disks extend beyond the body of the wheel to form its flange and this flange extends into the conduit a in the manner before referred to. The copper disk is thoroughly insulated from the wheel and from the steel disk by layers of insulating material, such as mica, placed on each side of it, and the middle portion of the copper disk is open to form a concentric chamber in which is located the soft rubber disk h. This rubber disk bears at its inner periphery against the hub or central portion of the wheel, and at its outer periphery it is in contact with the inner periphery of the copper disk. These disks are held in place by bolts i, which pass through enlarged openings in the copper disk, permitting the latter to assume a slightly eccentric position. The pressure placed upon the disks by the bolts i is such as to permit the copper disk to slide in a direction at right angles to the axis whenever heavy pressure is brought to bear against its periphery. The copper disk is in electrical connection by the wire j with a collar j' on the axle and from the latter the current is taken by means of the brush j^2 to the motor propelling the car. When in operative condition, the flange of the wheel, as before stated, passes into the slot of the conduit a^2 to such an extent that the copper disk f rests upon

and slightly presses against the conductor *d*. The current is therefore taken from the conductor by the disk and thence through the connection *j*, *j'* and j^2 to the motor. The method of mounting the conductor in the conduit permits of a gentle yielding pressure between the disk *f* and the conductor which insures a good contact without injury to the parts. The conductor is forced slightly downward as the car passes along and partakes of a gentle wave-like motion.

In case the car should become derailed, the full weight of the vehicle, which would then be brought upon the flange of the wheel, would cause the copper disk to slide upward and permit the steel disk *g*, and stronger portions of the flange to receive the weight and thus protect the copper disk from injury. As the wheel rolls upon the hard surface of the ground the copper disk will continually change its position, and in doing so will compress the rubber disk *h*. When the car is again placed upon the rails, the rubber disk will expand evenly and throw the copper disk into its proper concentric position.

In Fig. 1 we have illustrated an apparatus for clearing the conduit of any foreign matter which may have fallen into it. A forked arm, *m*, is pivoted upon the axle upon the opposite sides of the wheel, extends forward of the wheel, and is formed with a shovel or scoop point *m'*, which, when the car is in motion projects into the slot and runs in close proximity to the surface of the conductor. The point is provided with two rollers, m^2, and m^3, respectively, which run upon the surface of the conductor and upon the surface of the rail to maintain the point at a fixed distance from the conductor at all times. *o* is an electro-magnet of the solenoid type pivoted to the frame of the car and having its core, *o'* attached to a rod which is pivotally connected with the arm *m*. This solenoid derives its current from the main circuit, as illustrated by the dotted lines in Fig. 1 and when the car is moving the attraction of the magnet for its core thrusts the point of the arm *m* into the conduit, thus clearing it as the car moves along. When the car stops the spring *p*, lifts the arm from the conduit, and in case the car becomes derailed the severing of the circuit which then takes place de-energizes the magnet and allows the spring to lift the arm and prevents its injury. The arm will also carry immediately behind its point a brush which will remove particles left by the point of the arm, and in order to drain the conduit of water it will have openings indicated by the dotted lines in Fig. 3, which will either connect with a sewer or permit the water to flow into the earth.

We claim as our invention—

1. In an electric railway, a conduit formed in or adjacent to a rail upon which the vehicles travel and containing an electric conductor, in combination with a vehicle wheel provided with a concentric insulated spring mounted metallic disk projecting into the conduit and making electric connection with the conductor therein, substantially as described.

2. In an electric railway, a conduit formed in or adjacent to a rail upon which the vehicles travel and containing an electric conductor, in combination with a vehicle wheel carrying a concentric metallic insulated disk, the middle portion of the disk having a circular opening, and a second disk of elastic material located in the opening of the metallic disk, the said metallic disk projecting beyond the edges of the wheel and the elastic disk having the tendency to maintain it in that position, substantially as and for the purpose set forth.

3. In an electric railway, a conduit containing an electric conductor, resting upon a longitudinal serpentine spring, for the purpose set forth.

4. In an electric railway a conduit containing a trough in which is fixed an electric conductor, said trough being yieldingly supported upon a longitudinal serpentine spring.

5. In an electric railway, the combination of a conduit, a conduit cleaning device capable of moving into and out of the conduit, and an electro magnet controlling the position of the said cleaning device.

In testimony whereof we subscribe our signatures in presence of two witnesses.

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Witnesses:
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