

F. F. A. ACHARD.
Electro-Magnetic Car-Brakes.

No. 151,335.

Patented May 26, 1874.

Fig 1

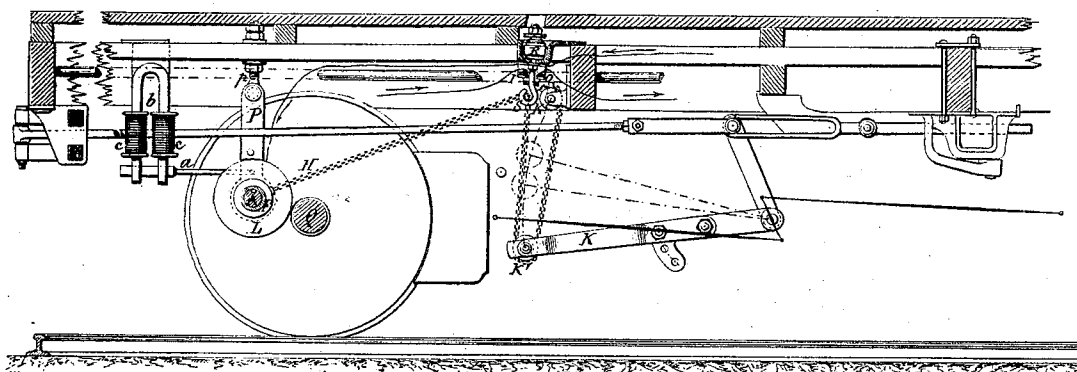
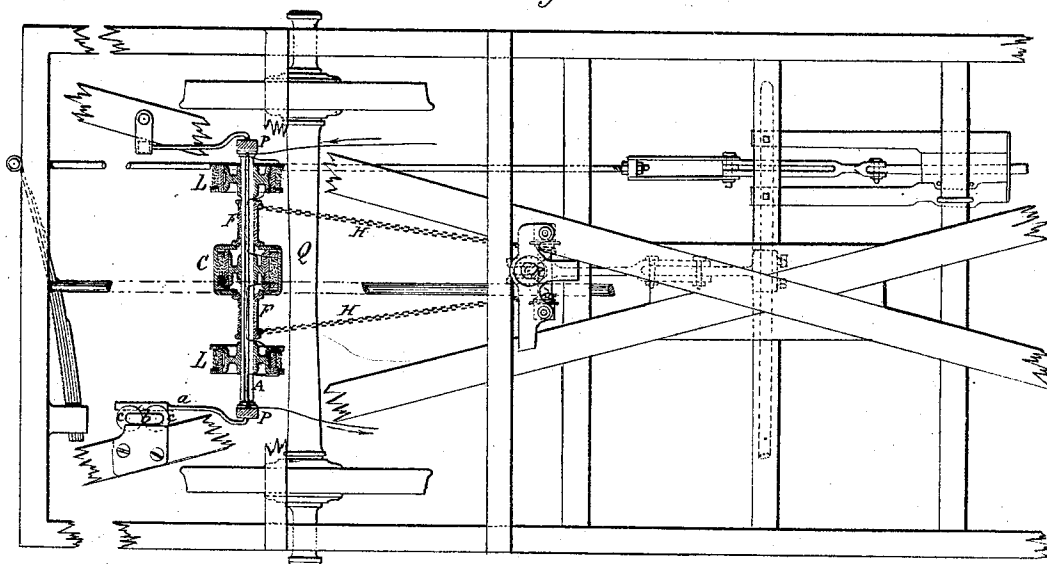


Fig 2



Witnesses.

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UNITED STATES PATENT OFFICE.

FRANCIS F. A. ACHARD, OF PARIS, FRANCE.

IMPROVEMENT IN ELECTRO-MAGNETIC CAR-BRAKES.

Specification forming part of Letters Patent No. **151,335**, dated May 26, 1874; application filed January 15, 1874.

To all whom it may concern:

Be it known that I, FRANCIS FERDINAND AUGUSTE ACHARD, of Paris, in the Republic of France, have invented a new Improvement in Electro-Magnetic Car-Brakes; and I do hereby declare the following, when taken in connection with the accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a longitudinal sectional elevation of a part of the frame of a wagon arranged according to my system; and in Fig. 2, a plan of the same with sectional parts.

This invention relates to an improvement upon an invention for which two American Letters Patent were granted to me, No. 49,842, dated the 5th day of September, 1865, and No. 59,805, dated the 20th day of November, 1866, for electro-magnetic car-brakes.

The principle upon which is founded my improved electro-magnetic car-brake consists in employing electro-magnetic devices to operate directly and automatically to engage the brakes without the aid of any other power.

My invention consists in the arrangement of two circular electro-magnets upon a shaft suspended so as to bring the said magnets into contact with the axle or remove them therefrom, combined with a horizontal magnet fixed at the center of said shaft, and a drum each side said central magnet loose on the shaft, and which, when in connected circuit and revolving, engages the said drums, and causes them to receive the revolution imparted from the axle through the circular magnets, and cause the winding up of the brake-chains, or their release when free, as more fully hereinafter described.

The whole system is suspended to the frame of the coach or car by two arms, P P, hung at p p, one of which is shown in Fig. 1. Upon a horizontal shaft, A, Fig. 2, are set, first, at the middle, a horizontal four-pole magnet, C; and, second, right and left, two circular electro-magnets, L L. These latter electro-magnets are arranged a short distance from the axle Q of the car, in order to be attracted against this axle as soon as the electric current circulates

through the conducting-wires. The magnetic adherence transmits instantaneously the rotating movement of the axle Q to the shaft A, carrying the whole system. Upon the drums F F, loose on the shaft A, are fixed the two ends of chain H H, which, passing over rollers or pulleys K', are attached to the lever K, by which the action is communicated to the brake-shoes. After leaving the pulley K' the chain is attached to the hook S, fixed to a spiral spring, R, intended for limiting the pressure of the shoes upon the wheels. That is performed by means of the two isolated pieces I and O, which, by coming into contact, close the circuit in advance of the electro-magnets, and thus produce the loosening. The chain is then free, and the two pieces I and O are removed the one from the other. In order to maintain the whole system removed from the axle Q, I arrange upon the shaft A a collar provided with a rod, a, which slides upon the poles of a magnet, b, bent into the form of a horseshoe. At rest this rod a is attached by the magnet, and maintains the system removed from the axle Q. But as soon as the current passes into the bobbins c c, which surround the branches of the magnet b, this magnet is unpolarized, and it loses its magnetic attraction; the whole system is thus released, and by its proper weight it comes against the axle Q. In some cases the whole system may be maintained at a distance from the axle Q by means of a single attractive spring. For pressing the brakes close against the wheels, it is only necessary to throw the electric current into the apparatus. Immediately the circular electro-magnets L L are attracted by the axle Q, and the magnetic adherence transmits the rotating movement of this axle Q to the shaft A, carrying the armature and drums F F. By the fact of the circulation of the current, these same drums are adhering very strongly against the armature of the four-pole electro-magnet C, and there revolve with the shaft A. Winding the chain H H and drawing up the lever K causes the shoes to exert upon the face of the wheels an increasing pressure in case of need, until entire stoppage is produced.

For loosening the brakes the conductor

must interrupt the circulation of the electric current. The armature or drums F F again come free and loose the chain, which allows the lever K to fall and remove the shoes from the face of the wheels, and the circular electromagnets resume their position of rest away from the axle Q, by the effect of the magnetic attraction of the magnet *b* upon the rod *a*.

Suitable apparatus is arranged upon the locomotive, and in case of need upon the coaches, so that the engineer and other guards on the train may apply or loosen all the brakes of the train at the same time.

I claim as my invention—

The suspended shaft A, carrying the circular magnets L L, the central magnet C, and the loose drums F F, combined with the axle Q and brake-chains H, substantially as and for the purpose specified.

In testimony whereof I have signed my name to this specification before two subscribing witnesses.

F. F. A. ACHARD.

Witnesses:

J. ARMENGAUD, Jeune,
ALBERT CAHENT.