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R. SCHRÖDLEIN.

CAR STARTER AND BRAKE.

No. 501,447. Patented July 11, 1893.

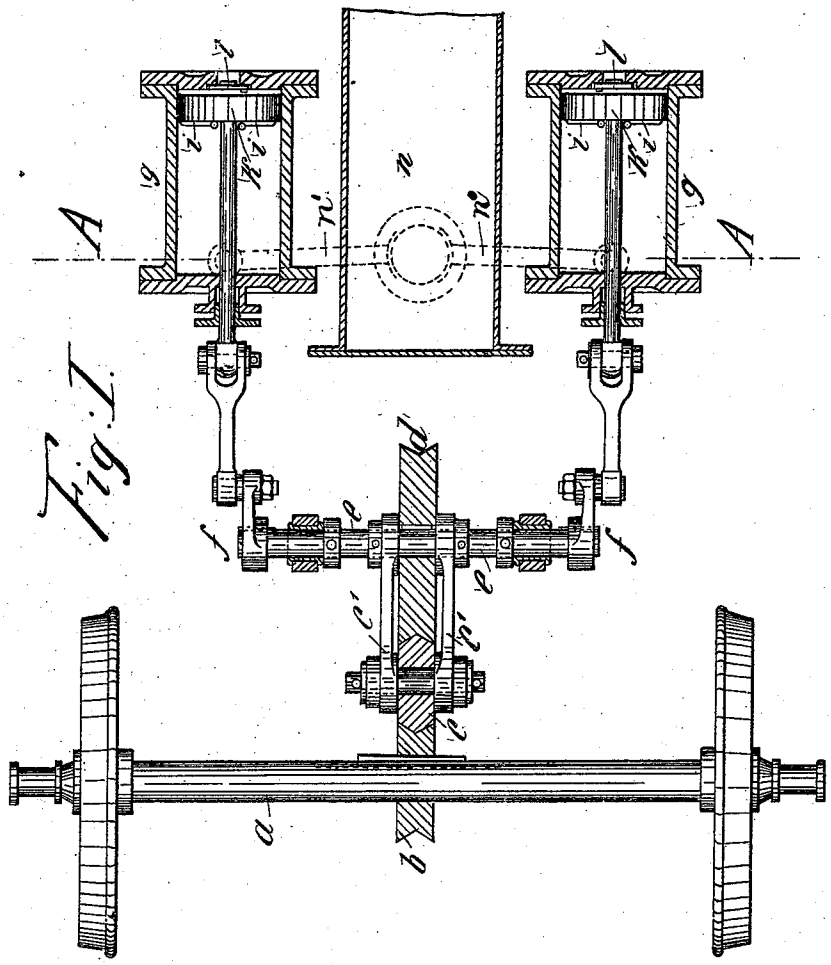

Fig. 1.

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By, James L. Norris.
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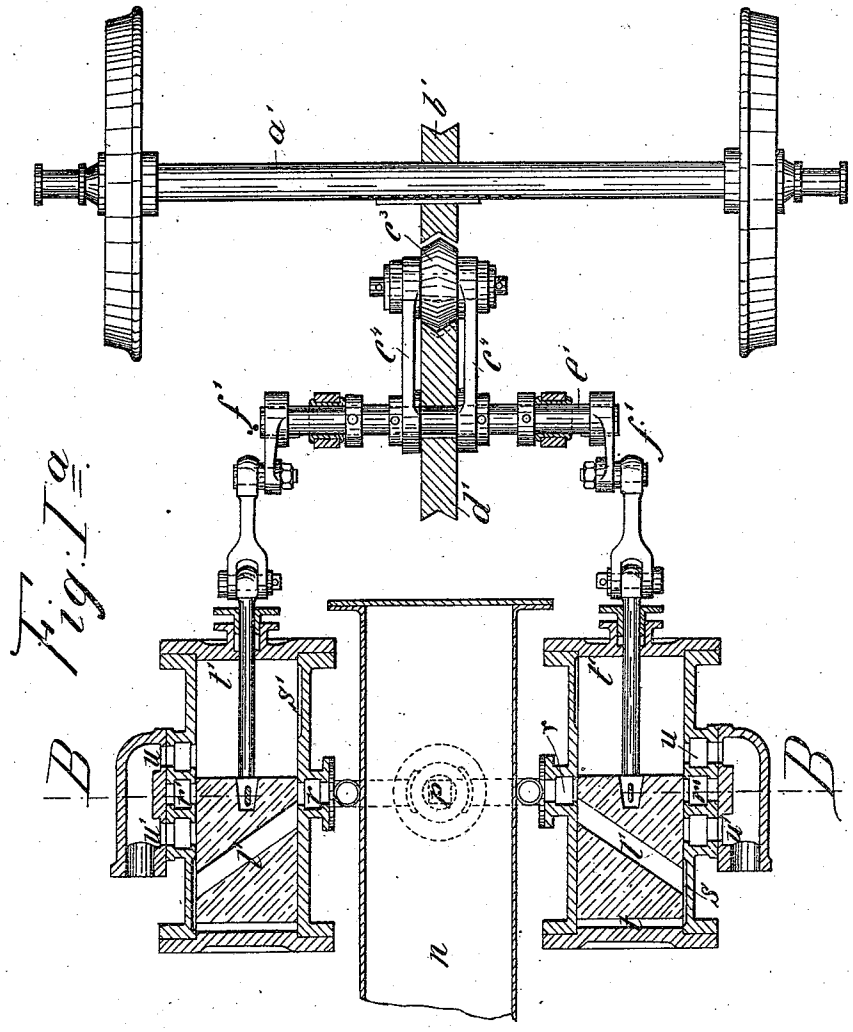

Fig. I.

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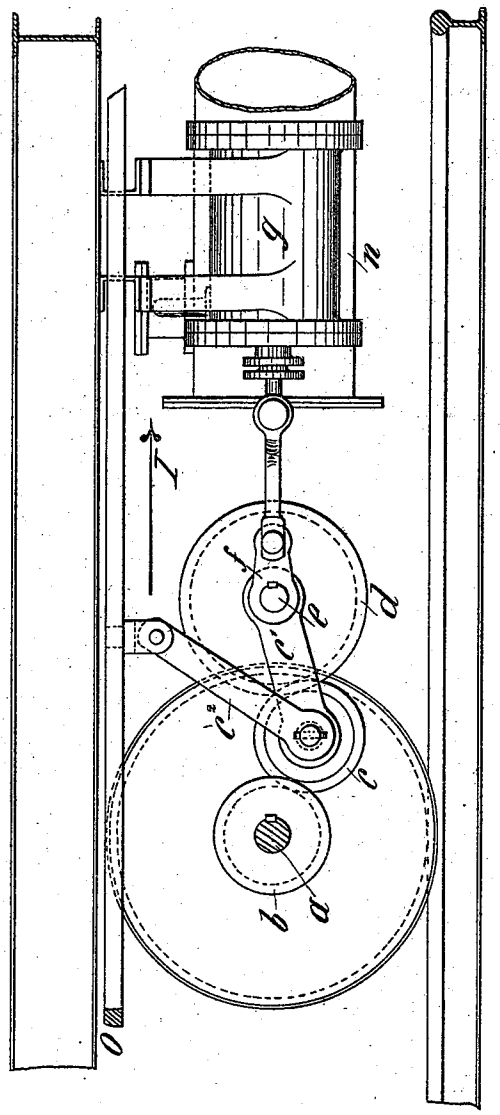
Fig. II.



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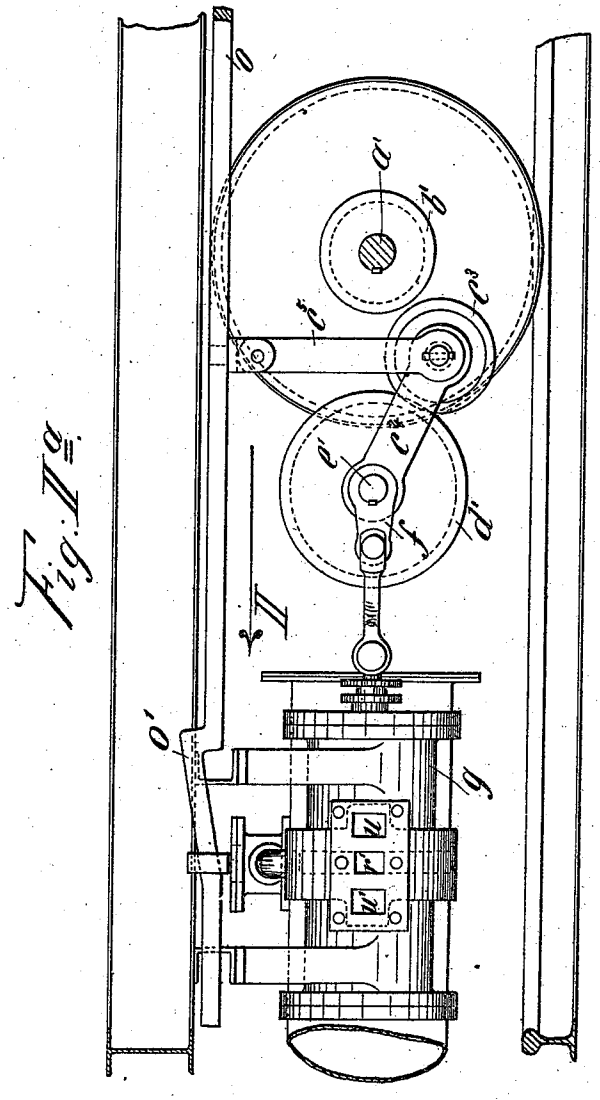

Fig. 4.

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(No Model.) 5 Sheets—Sheet 5.

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CAR STARTER AND BRAKE.

No. 501,447. Patented July 11, 1893.

Fig. III.

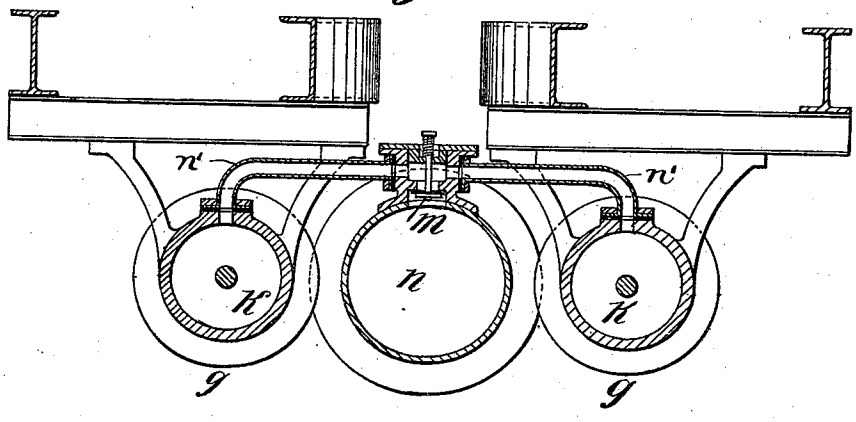


Fig. IV.

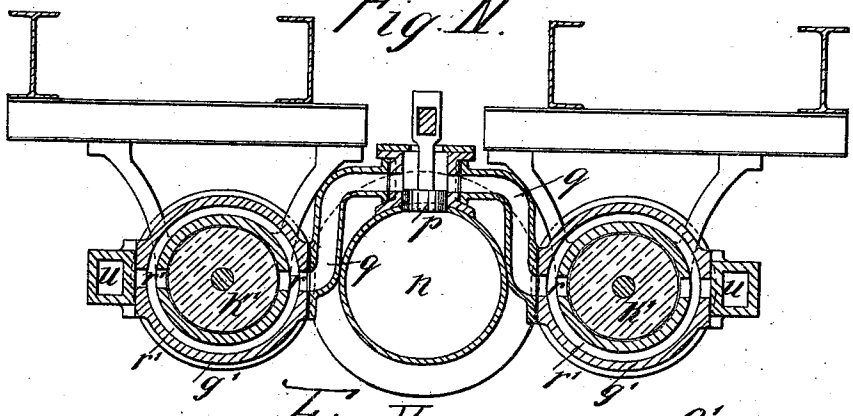
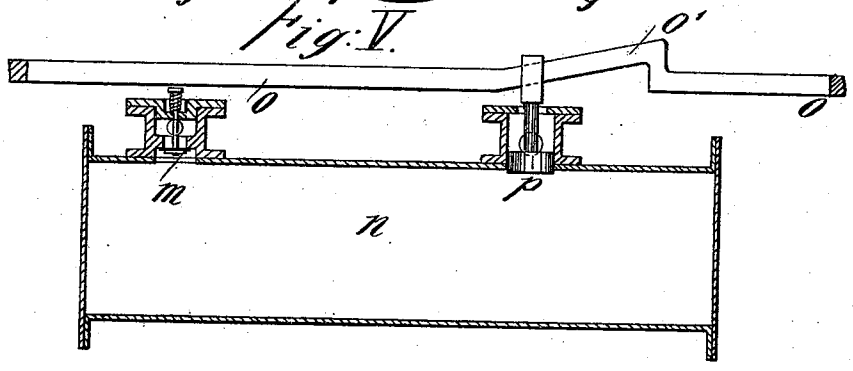


Fig. V.



Witnesses
Geo. W. Rea
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UNITED STATES PATENT OFFICE.

RICHARD SCHRÖDLEIN, OF AUSCHA, AUSTRIA-HUNGARY.

CAR STARTER AND BRAKE.

SPECIFICATION forming part of Letters Patent No. 501,447, dated July 11, 1893.

Application filed October 8, 1892. Serial No. 448,237. (No model.)

To all whom it may concern:

Be it known that I, RICHARD SCHRÖDLEIN, of Auscha, near Leitmeritz, Bohemia, Austria-Hungary, have invented certain new and useful Improvements in Apparatus for Braking and Starting Vehicles, of which the following is a full, clear, and exact specification.

This invention relates to apparatus for braking and starting railway cars and other vehicles, and has for its object to provide novel means whereby the momentum of the vehicle, when the brakes are applied, stores power heretofore wasted, which power is utilized for restarting, or assisting in restarting the vehicle at the proper time.

To accomplish this object my invention involves the features of construction and the combination or arrangement of parts hereinafter described and claimed, reference being made to the accompanying drawings, in which—

Figures I and I^a, when taken together, represent a sectional plan view of my invention in connection with two car axles of a car. Figs. II and II^a, when taken together, represent a plan view of the same. Fig. III is a cross sectional view taken on the line A A of Fig. I. Fig. IV is a cross sectional view taken on the line B B of Fig. I^a; and Fig. V is a longitudinal sectional view of the air reservoir.

In order to enable those skilled in the art to make and use my invention, I will now describe the same in detail, referring to the drawings wherein—

The letters *a a'* indicate the axles of a railway car or other vehicle, provided respectively with friction gear wheels *b b'*, and *e e'* counter shafts arranged in juxtaposition to the car axles. The counter-shaft *e* is provided with a friction-driven gear-wheel *d*, and with cranks *f* connected respectively with the piston-rods of pistons K moving respectively in cylinders *q*. The counter shaft *e* is also provided with a suitable frame comprising links *c'* which support the journal or axle of a transmitting friction gear-wheel *c* adapted to be moved into and out of contact with the friction gear-wheel *b* on the axle *a*. The frame composed of the link *c'* is pivotally suspended by a frame composed of links c^2 suitably suspended from a horizontal rod O in such manner that when the said rod is moved in the direction of the arrow I, Fig. II, the transmitting gear *c* is thrown into engagement with the friction gear-wheel *b*, and the rotary motion of the car axle *a* is transmitted to the gear-wheel *d* for rotating the counter-shaft *e*, and thus causing the cranks *f* to reciprocate the pistons K. An air reservoir *n*, interposed between the cylinders *g*, is provided with suitable pipe connections *n'* leading respectively to the cylinders *g*, and the latter are provided with air valves *l*, while the pistons K are provided with air valves *i*, all in such manner that when the pistons are reciprocated, as before explained, atmospheric air is pumped into and compressed in the air reservoir *n*, thereby storing energy to be utilized, as will hereinafter appear.

The counter-shaft *e'* is provided with cranks *f'* connected respectively with the piston rods of pistons K', having oblique passages *l'*. The counter-shaft *e'* is also provided with a friction-driven gear wheel *d'*, and with a frame composed of links c^4 which support the journal or axle of a friction-transmitting gear-wheel c^3, adapted to be moved into and out of engagement with the friction gear-wheel *b'* on the car axle *a'*. The frame composed of the links c^4 is supported by a frame composed of links c^5, pivotally suspended from the horizontal rod O, all in such manner that when said rod is moved in the direction of the arrow II, Fig. II^a, the friction-transmitting gear-wheel c^3 is moved into engagement with the friction-gear wheel *b'*. The pistons K' are each formed with an oblique passage *l'*, which, in the position shown in Fig. I^a communicate with the air inlet *r* of pipes or passages *q* that connect the cylinders *g'* with the air reservoir *n*. The cylinders *g'* are provided with channels S S', and when the parts are in the position, Fig. I^a and a valve *p* which governs communication with the air reservoir *n* is opened, as hereinafter explained, the compressed air will flow through the pipes or passages *q*, inlets *r*, passages *l*, and channels S to the spaces *t* behind the pistons K', thereby forcing the pistons toward the opposite ends

of the cylinders. When the pistons in their forward stroke come into such position that the oblique passages l' communicate with the channels S′ of the ports r', the compressed air will flow into the space t' in order to impart back stroke to the pistons. The exhausted compressed air passes from the cylinders through the ports $u\,u'$, which latter open to the external atmosphere.

A check-valve m is provided on the air-reservoir n to permit the air to flow from the pipes or channels n' into the air reservoir, while preventing escape of the air from the reservoir back through said pipes or channels n'.

The horizontal rod O is located below the frame of the car or vehicle and the rods of several cars or vehicles constituting a train may be coupled together for simultaneous movement. The rod O is provided with a wedge or projection O′ to engage the valve p, so that when the rod O is moved in the direction of the arrow II, Fig. 2ª, the wedge or projection O will open the valve and permit compressed air from the air reservoir n to flow through the pipes or channels q to the cylinders q', as before explained.

In the practical operation of the apparatus, when the brakes of the car or vehicle are applied, the rod O is moved in the direction of the arrow I, Fig. II, thereby throwing the friction-transmitting gear-wheel c into gear with the friction gear-wheel b, and operating the pistons K to force air into the air reservoir n, where such air is stored up to be subsequently utilized in restarting the vehicle. In restarting, the steam-valve of the locomotive is opened so that the railway train commences its movement, and the axles of the vehicle turn through a portion of their rotation. The rod O is then moved in the direction of the arrow II, Fig. IIª, whereby the friction-transmitting gear-wheel c^3 is thrown into gear with the friction gear-wheel b', and the valve p is opened to admit compressed air from the reservoir n to the cylinders q', whereby the pistons K′ are reciprocated and the counter-shaft e' is rotated for imparting a rotary motion to the friction-gear wheel b', by which power is transmitted to the car-axle a' for restarting, or aiding in restarting the car or other vehicle.

The apparatus may be arranged on one or more vehicles of a railway train, or on vehicles of any description, and the movements of the rod O are effected either by the guard from the interior of each vehicle, or by the engineer on the locomotive.

The cylinders g, with their pistons and adjuncts, constitute an air pump for compressing and storing air in the reservoir n, which air is utilized to restart the vehicle through the medium of the cylinders g' and their pistons.

Having thus described my invention, what I claim is—

1. The combination with a vehicle, of a compressed air reservoir, an air pump for forcing air into the reservoir, pump-driving devices movable into and out of gear with one of the vehicle axles, cylinders containing pistons, and provided with pipes or channels to communicate with the air reservoir, a valve for controlling the flow of compressed air from the reservoir through the said pipes or channels, gearing driven by the piston rods for imparting power to one of the car axles to aid in starting the vehicle, and means for operating the valve, and for throwing the pump-driving devices, at will, into and out of gear with the vehicle axle which operates said devices, substantially as described.

2. The combination with a vehicle, of a compressed air reservoir, air compressing cylinders having pistons, a crank-shaft connected to the piston-rods, a friction wheel mounted on the crank-shaft, a friction wheel mounted on one of the vehicle axles, an intermediate friction-transmitting gear wheel, and means for throwing the friction-transmitting gear wheel into and out of engagement with the friction wheel on the vehicle axle, substantially as described.

3. The combination with a vehicle, of a friction wheel mounted on the vehicle axle, a crank-shaft having a friction wheel, an intermediate friction wheel adapted to be moved into engagement with the friction wheel on the vehicle axle, a longitudinal movable rod for moving the intermediate friction wheel into and out of engagement with the friction gear on the vehicle axle, cylinders having pistons connected with the crank-shaft, and an air reservoir into which air is forced by the action of the pistons, substantially as described.

4. The combination of the vehicle axles a a' having wheels b b', counter shafts $e\,e'$ having cranks $f\,f'$ and gear-wheels $d\,d'$, transmitting gears c c^3, means for moving the transmitting gears into and out of engagement with the gears on the vehicle axles and air reservoir n, cylinders $g\,g'$ having pistons connected with the crank-shafts, a valve for controlling the flow of compressed air from the air reservoir to one pair of cylinders, and means for operating said valve, substantially as described.

5. The combination with the axle a', of a vehicle, cylinders g' having pistons and gearing for connecting the pistons with the vehicle axle, of an air reservoir n, a valve p, and a rod O which operates the valve and throws the gearing into engagement with the vehicle axle, substantially as described.

6. The combination with the vehicle axles, of an air reservoir, an air pump, gearing adapted to be thrown into engagement with one of the vehicle axles to operate the pump and force air into the reservoir, a cylinder having a piston and connected with the air reservoir, a valve for controlling the flow of

compressed air from the reservoir to said cylinder, gearing driven by the cylinder-piston and movable into engagement with one of the vehicle axles to aid in starting the vehicle, and means for operating said valve and gearing, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

RICHARD SCHRÖDLEIN.

Witnesses:
WILHELM BINDEWATS,
PAUL TEISHMANN.