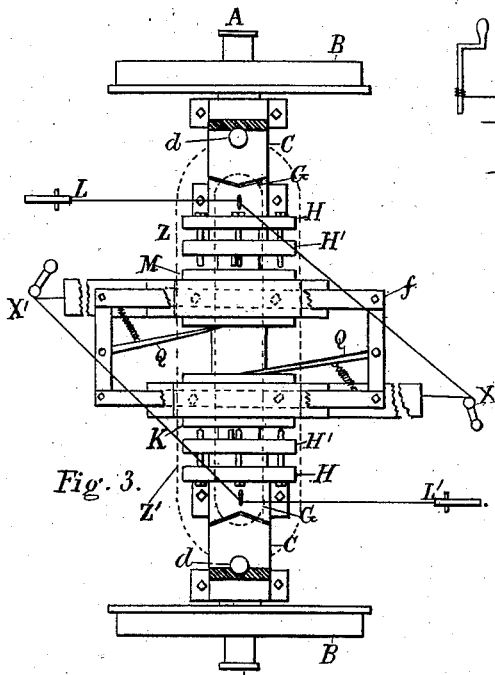
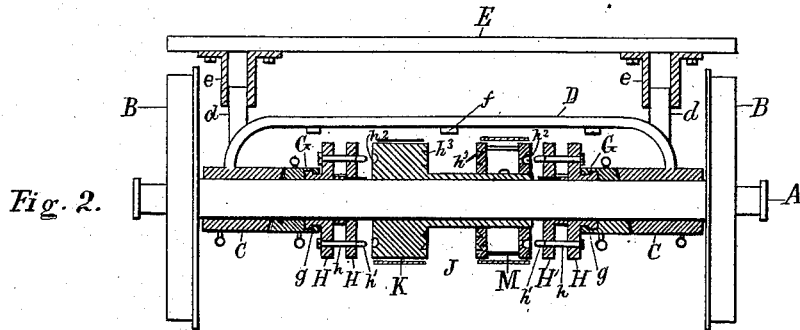
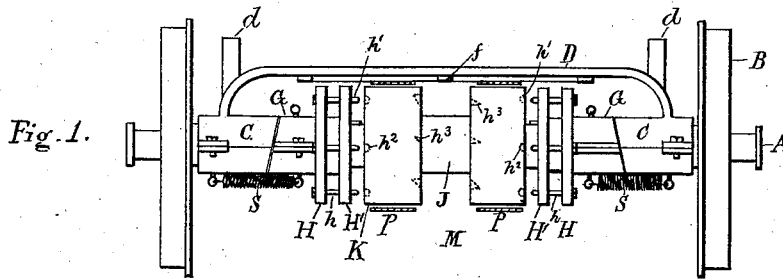


(No Model.)

D. HALL.
CAR BRAKE AND STARTER.

No. 347,346.

Patented Aug. 17, 1886.



WITNESSES:

Jas. J. Eubank.
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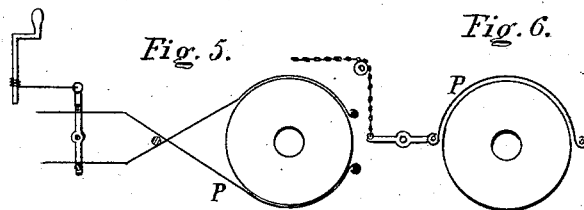


Fig. 6.

Fig. 7.

Fig. 8.

Fig. 4.

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CAR BRAKE AND STARTER.

SPECIFICATION forming part of Letters Patent No. 347,346, dated August 17, 1886.

Application filed October 31, 1885. Serial No. 181,538. (No model.)

To all whom it may concern:

Be it known that I, DANIEL HALL, a citizen of the United States, and a resident of Galt, in the county of Grundy and State of Missouri, have invented certain new and useful Improvements in Car Brakes and Starters, of which the following is a specification.

My invention relates to certain improvements of a similar character to those described in an application filed by me August 3, 1885, and allowed September 23, 1885; and it consists in certain novel details of construction and operation, as hereinafter more particularly described.

In the accompanying drawings, Figure 1 is a side view of an axle and the working parts of the apparatus carried thereby. Fig. 2 is a vertical section of the same. Fig. 3 is a top view partly in section. Fig. 4 is a detail view. Figs. 5, 6, 7, and 8 are detail views hereinafter referred to.

Similar letters indicate similar parts.

A designates the axle, and B the wheels, of a horse-railway car. Surrounding the axle, near the ends, are two sleeves, C C, connected by an elliptical arched frame, D, near the ends of which are two upright posts, *d d*, fitting in sockets *see* on the underside of a frame, E. The inner end of each sleeve C is diagonal with relation to its length, instead of being at a right angle therewith, and fitting against this diagonal end is the diagonal end of another sleeve, G, to which is connected a clutch-wheel consisting of two disks, H H', and a number of pins, *h*, having pawls *h'*, for engaging the drum and the barrel. The clutch-wheel H' is keyed to the axle, and the clutch-wheel H is feathered on the sleeve H', so as to turn with it, and the connection with the sleeve G is made by means of a circular dovetail or tongue-and-groove coupling, *g*.

The sleeves C C and G G are each made in two semi-cylindrical halves provided with flanges or lugs, by means of which they are bolted together in place on the axle.

Surrounding the axle midway of its length, and between the clutch-wheels H H', is a sleeve, J, fitting loosely on the axle, so that it may turn thereon. At one end of this sleeve is attached a drum, K, of the same diameter as the clutch-wheel H. The side of the drum toward the clutch-wheel is provided with a

number of pockets corresponding with the clutch-pins *h* and pawls *h'*. On the opposite end of the sleeve J is a barrel, M, containing a coiled spring, as described in my former application, one end of which is attached to the sleeve and the other end to the inner surface of the barrel, or to one of the rods connecting the ends thereof. The end of the barrel toward the clutch-wheel is provided with pockets *h''*, corresponding with the clutch-pawls *h'*.

On the bottom of the arched frame D is a frame, *f*, from which extends two pawls, Q Q, for engagement with sockets or notches *h'''* in the inner ends of the drum K and the barrel M, respectively. The pawls are held in engagement by means of springs, and are disengaged by means of a cord, chain, or other device within the reach of the driver.

The drum K and barrel M are engaged by clamping-brakes similar to that described in my former application as two strips or bars, P P, which are curved to embrace the upper and lower surfaces of said drum and barrel, and are operated in a similar manner.

In some cases the form of the brake may be modified, as shown at P in Figs. 5, 6, 7, and 8, and may be made to bear on both the upper and lower surfaces, or on either the upper or lower, as shown.

The operation of my invention is as follows: When the car is going in one direction, and it is desired to stop, the brake is applied to the barrel M, and the clutch toward the left hand of the drawing is thrown into engagement by turning the brake-crank X'. The drum and its sleeve is thus thrown in connection with the axle, and turns with the axle, thus winding up the spring in the barrel M and stopping the car. The lever L is then drawn backward, engaging the clutch Z with the barrel M. The brake-shaft X' is then turned in the opposite direction, disengaging the clutch Z', liberating the brake from the barrel M. The force or power of the spring is then transmitted, through the clutch Z, to the axle of the car, turning it in a forward direction and starting the car. When the car is going in an opposite direction, the brake is applied to the drum K, and the clutch Z, is thrown into connection with the barrel M by turning the brake-crank X. The barrel is thus thrown into connection, through the clutch Z, with the axle of the car, and revolves with

it, winding up the spring and stopping the car. The lever L is then drawn backward, throwing the clutch Z' into connection with the drum K and the sleeve J. The brake-crank X is then turned in a reverse direction, disengaging the clutch Z and releasing the brake from the drum K. The force of the spring is then exerted on the car-axle, through the sleeve J and the clutch Z', starting the car.

Whenever the car is running, before applying the brake the lever L or the lever L' must be moved forward to allow its clutch to become disengaged. If desirable, the power of the axle, which is stored through the medium of the spring, may be utilized when the car is in motion, inasmuch as by leaving both clutches in engagement with the drum and spring-barrel, respectively, when the brakes are taken off, the whole revolves with the axle.

The clutches are thrown into and out of engagement as follows: The sleeves G are suitably connected by chains with the brake-shaft operated by the driver, so that when said chains are wound around said brake-shaft the lateral action of the inclined surface of the sleeve G against the inclined surface of the sleeve C is the same as the action of two inclined planes moving in opposite directions, and the clutch is forced inward by a cam motion of the sleeve G. When the cam G is released, it is drawn back by the spring S, drawing the clutch-wheel back with it.

When the drum K or barrel M are being operated on, they are prevented from turning, by means of the compressing-brakes, until the spring is wound up or the car is brought to a stand. The spring is prevented from expending its force in a reverse direction by the pawls Q Q.

Fig. 4 shows a device for stopping the car suddenly in case of emergency—as, for instance, to prevent a collision, or to avoid running over a person. This device is applicable to cars of any kind, without reference to any particular braking or starting mechanism. It consists of a wheel or disk, R, fixed to the axle, and having abrupt angular notches *r* in its periphery, and a dog or pawl, T, having one end pivoted to a hanger, *t*, under the car, and the other end formed for engagement with the notches. It is disengaged by means of a swinging lifting-bar, V, connected by a cord or chain, *v*, to a point within the reach of the driver, and it may be suddenly dropped into

engagement when desired. This device may be attached and operated from either or both ends of the car.

I claim—

1. In a car brake and starter, a mechanism comprising the drum K, spring-barrel M, brake P, and clutch-wheel H, for storing the power of the axle, to be used either in starting the vehicle or when the vehicle is in motion, substantially as herein described.

2. The combination, with the axle A, of the sleeves C G, having their contiguous surfaces inclined to operate with a cam motion, one of said sleeves carrying a clutch-wheel, and the spring S, connecting said two sleeves together, substantially as and for the purpose herein described.

3. The combination of the sleeve G and clutch-wheels H with the drum K and spring-barrel M, connected together on the axle, and a means for actuating the sleeves, and thereby throwing the clutch-wheels, with the gear, into engagement with the drum and spring-barrel, respectively, substantially as and for the purpose herein described.

4. The combination, with the drum K and spring-barrel M, of the spring-pawl Q Q, arranged to engage with notches on the inner or opposed faces of the drum and barrel, substantially as and for the purpose herein described.

5. The combination, with the drum K, spring-barrel M, and clutch-wheels H, for engaging said drum and barrel laterally, of the brake P, consisting of a strap adapted to engage the circumference of the barrel or drum, one end of said strap being attached to a fixed support and the other end to a traction device, substantially as and for the purpose herein described.

6. The stop mechanism, consisting of the disk R, provided with notches *r*, the dog or pawl T, engaging therewith, and the lifting-bar V, engaging said dog, substantially as and for the purpose herein described.

7. The arched elliptical frame D, having upright posts *d d*, fitting into sockets *e e*, substantially as herein shown and described.

Signed at New York, in the county of New York and State of New York.

DANIEL HALL.

Witnesses:

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