(No Model.)

A. J. WRIGHT.

BRAKE MECHANISM FOR CARS.

No. 456,609. Patented July 28, 1891.

Fig. 1

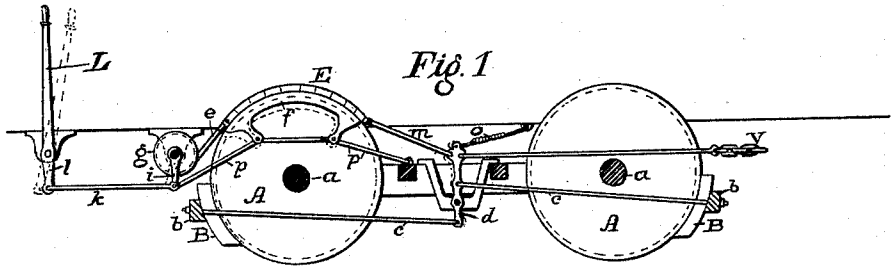


Fig. 2

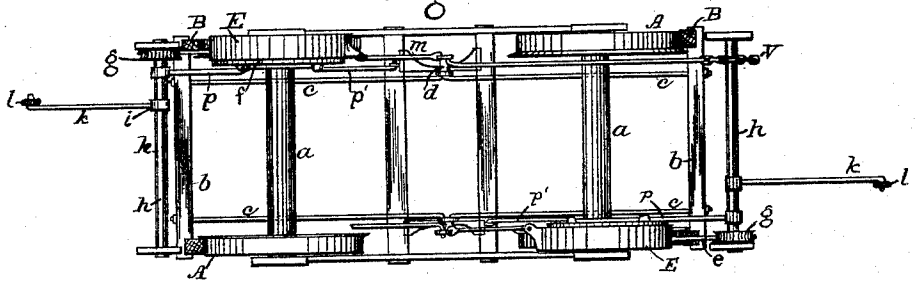


Fig. 3

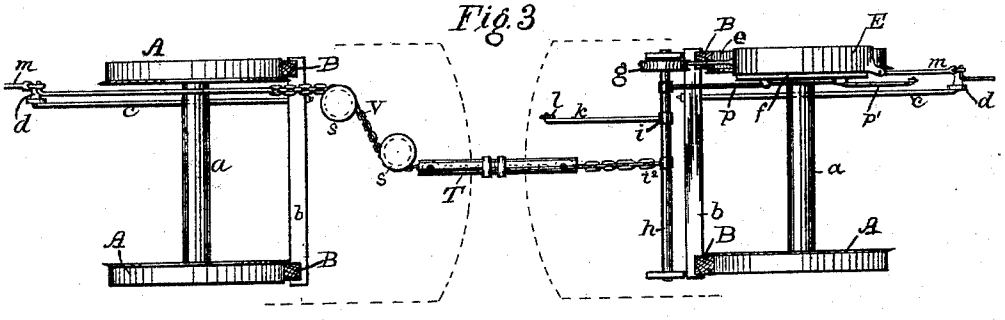


Fig. 5

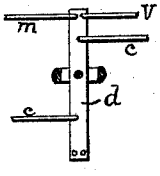
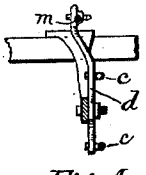


Fig. 4



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BRAKE MECHANISM FOR CARS.

SPECIFICATION forming part of Letters Patent No. 456,609, dated July 28, 1891.

Application filed November 3, 1890. Serial No. 370,258. (No model.)

To all whom it may concern:

Be it known that I, ALLEN J. WRIGHT, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Brake Mechanism for Cars; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in brake mechanism for street-railway and other cars. It is in the nature of an improvement upon the inventions patented to me by Letters Patent Nos. 430,455 and 430,500, dated June 17, 1890; and it consists in the combination and arrangement of parts hereinafter described, and specifically pointed out in the claims, and especially in the application of the friction engagement by which the brakes are set to the car-wheel instead of to a separate friction-wheel, whereby a simplified construction and increased efficiency are obtained.

In the drawings, Figure 1 represents in elevation the running-gear of a car embracing my invention. Fig. 2 is a plan view of the same. Fig. 3 is a plan view showing the method of connecting two cars, as hereinafter described. Figs. 4 and 5 are detail views of the brake-lever. Fig. 4 is a view in elevation of the vertical lever viewed lengthwise of the car. Fig. 5 is a plan view of the horizontal lever.

A A represent the car-wheels; *a a*, their axles; B B, the brake-shoes; *b b*, the brake-beams; *c c*, the brake-rods, and *d* the brake-lever or connecting-lever by which both brakes are simultaneously set, all of which parts are of the usual construction.

E is a friction-band composed of short plates or blocks adapted to fit the tread of the car-wheel, and, if preferred, the flange also, and are flexibly connected together, as by securing them to a flexible sheet or strap of metal, or to jointed bars or links, in such manner that when a strain is brought upon the band, as hereinafter described, it shall closely hug the wheel and conform to its surface, so as to exercise the greater friction thereon. I do not, however, confine myself to the use of such band, as in some cases a single shoe is sufficient to answer the purpose, accomplishing the same result with less mechanism, and hence less expense.

At its forward end the friction-band E is connected by a cord, chain, rod, or combination of rod and chain or rod and cord *e* to a drum *g*, secured to a shaft *h* in front of and conveniently near the car-wheel. The shaft *h* is by means of an arm *i* secured thereto, connected to the short arm *l* of the hand-lever L, placed at the end of the car for operating the brakes. This connection may be a cord or chain, but is preferably a rod *k*, for reasons hereinafter stated. The rear end of the friction-band E is connected by a rod, cord, or chain *m* to the upper or outer end of lever *d*, and a spring *o* is attached to the lever *d* and to the car body or truck in such manner as to draw back the lever when the pull of the band E is released, and thus, in conjunction with the gravity of the brake beams and shoes, throw off the brakes. In order to mantain the friction-band E out of contact with the car-wheel when the brakes are "off," a frame *f*, which may be a plate or a rod bent to proper shape, is adjusted in close proximity to the car-wheel and of a shape on its upper side to conform to the contour of the periphery of the wheel and to bear against the under side of the friction-band E, which somewhat overhangs the wheel. The frame *f* is supported pivotally on rigid connections, one of which *p* leads forward and is connected to the short arm *l* of the hand-lever, (or to an arm on the shaft *h*,) and the other *p'* leads back and is pivoted upon the trucks. Preferably the connections *p p'* are rods or bars and are pivoted to the frame *f* at opposite ends thereof and on a level slightly above that of the pivots of their other ends, as is shown in Fig. 1.

The operation of the device is as follows: Normally the brakes are held by the spring *o* in the released position, which is shown by the full lines in Fig. 1. When it is desired to set the brakes, the lever L is drawn back, as shown by dotted lines in Fig. 1. This draws forward the arm *i*, and by winding up the chain *e* on the drum *g* draws forward the friction-band E, as indicated by dotted lines in Fig. 1, and at the same time the rod *p*

draws forward and downward the frame *f*, which allows the band E to rest upon the wheel and by its frictional contact therewith to travel a short distance therewith. The forward motion of the friction-band drawing by the rod or chain *m* on the lever *d* sets the brakes. The pull upon the hand-lever L being so powerfully assisted by the friction of the band E, which itself acts as a brake-shoe, combines to set the brakes with far greater power than is obtainable with any mechanism except a positive-acting clutch on either axle or wheel; but, the movement of the brake-shoes as ordinarily constructed being very short, they are by the forward motion of the band E brought into contact with and light bearing on the wheels before the frame *f* has so far moved as to allow the band E its full bearing on the wheel. Consequently the transition from the direct pull from the hand-lever on the brakes to that of the combined hand-pull and the friction-clutch upon the wheel is gradual and without the shock usually experienced in the application of friction-clutch brakes. As the lever L is thrown forward to release the brakes, the weight of the beams *b* and shoes B, assisted by the spring *o*, draws back the band E as the brake-shoes fall back from the wheels, and simultaneously the rod *p* lifts the frame *f* against the friction-band and lifts the latter out of contact with the wheel. To assist in moving back the friction-band, I prefer to form the connection *k* of rod instead of chain, in order that it may push back the arm *i*, and thus positively rotate the drum *g* and slack off the chain. While the gravity of the brake beams and shoes is usually sufficient alone to effect the throwing off of the brakes, as just described, I add the spring *o*, not of necessity, but for greater efficiency.

The mechanism so far described is adapted to a car running always with the same end forward, which in Fig. 1 would be the left-hand end. It is obvious, however, that to adapt the same to a car required to run with either end forward requires only the duplication of the hand-lever, rock-shaft, friction-band, and their various fittings and connections at each end of the car. This arrangement is shown in the plan view, Fig. 2, and is a part of my invention.

Various modifications of construction will readily suggest themselves to the skilled mechanic. For instance, the friction-band may be made in one or two pieces, the drum *g* may be placed on the pivot of the lever L instead of on a separate shaft, or in place of the drum a half-drum or segment may be used, &c. The lever *d* may be placed in either a vertical or horizontal position, as the construction of the truck or the presence of other mechanism may render most convenient. Its horizontal arrangement is shown in Fig. 5.

In the case of cable-grip cars or motor-cars drawing trail-cars it is often desirable to brake all the cars in the train from the motor or grip car, thus enabling the gripman or motor-man to do the work which otherwise would require a brakeman on each of the trail-cars, and to do it more quickly. This is most effectually accomplished by my invention by means of the great power exercised by the clutch of the friction-band applied by the following simple means: Each of the cars being provided with the previously-described brake-actuating mechanism and brakes, a chain V is attached to the upper or outer end of the brake-lever *d*, as shown in Figs. 1, 3, and 5, and is carried thence around the sheaves *s s* back to the center line of the car, thence through a tubular draw-bar or connecting-bar T (by which the cars may be coupled) to an arm i^2 on shaft *h* in the center line of the cars, as shown in Fig. 3. Each of the cars being thus equipped and coupled, it is readily seen that when the brakes are applied on the first car the lever *d* will draw on the chain V and actuate the brakes on the following car by the action of the shaft *h*, drum *g*, and band E on that car, with their connections, and the brakes on the second car will be set with the combined power of the friction-bands E and their connections on both the first and second cars. Similiarly the brake-lever on the second car will operate to set the brakes on the third car and so on successively, each car having its brakes set with the combined power of its own friction-band and the pull on its brake-actuating mechanism which is transmitted from the car in front of it, as hereinabove described.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In car-brake mechanism, the combination, with the car-wheel, of a friction-band adapted to engage the wheel and operatively connected with the brakes, mechanism for causing said band to engage the car-wheel, and mechanism for disengaging said band from the wheel and supporting it out of contact therewith, substantially as described.

2. In car-brake mechanism, the combination, with the car-wheel, of a friction-band adapted to engage the car-wheel and operatively connected with the brakes, mechanism supporting said band normally out of contact with the wheel, and means for causing said band to engage the car-wheel and operate the brakes, substantially as described.

3. In car-brake mechanism, the combination of the friction-band adapted to engage the car-wheel and operatively connected with the brakes, the supporting-frame adapted to maintain said band normally out of contact with the wheel and adjustably connected with the brake-operating mechanism, the rock-shaft and drum connected with said friction-band, and the hand-lever operatively connected with said rock-shaft to cause said band to engage the car-wheel and operate the brakes, substantially as described.

4. In car-brake mechanism, the combination of a friction-band adapted to engage the

car-wheel and operatively connected with the brakes, a movable frame pivotally supported and adapted to bear against said band and maintain the same out of contact with the wheel, a rock-shaft connected with said band and with said frame, and an operating hand-lever connected with said rock-shaft to actuate said mechanism and set the brakes, substantially as described.

5. The combination of the friction-band adapted to engage the car-wheel and having its rearward end connected operatively with the brakes and its forward end connected with the drum or equivalent for bringing it into engagement with the wheel, the oscillating frame for supporting said band out of contact with the wheel, the rock-shaft carrying the drum and having an arm rigidly connected with said frame for actuating the same, and the hand-lever rigidly connected with an arm of said rock-shaft for operating the brake mechanism, substantially as described.

6. The combination, in car-brake mechanism, of the brake-actuating mechanism, substantially such as described, on the several cars of a train, and a connecting-chain and sheaves for connecting the brake-lever of each car with the brake-actuating mechanism of the following car, whereby the brake-actuating mechanism of each car is caused to automatically set the brakes of the following car, substantially as described.

In testimony whereof I hereto affix my signature in presence of two witnesses.

ALLEN J. WRIGHT.

Witnesses:
H. W. WARD,
L. PRENTISS.