(No Model.) 2 Sheets—Sheet 1.

A. J. WRIGHT.

BRAKE MECHANISM FOR CARS.

No. 430,500. Patented June 17, 1890.

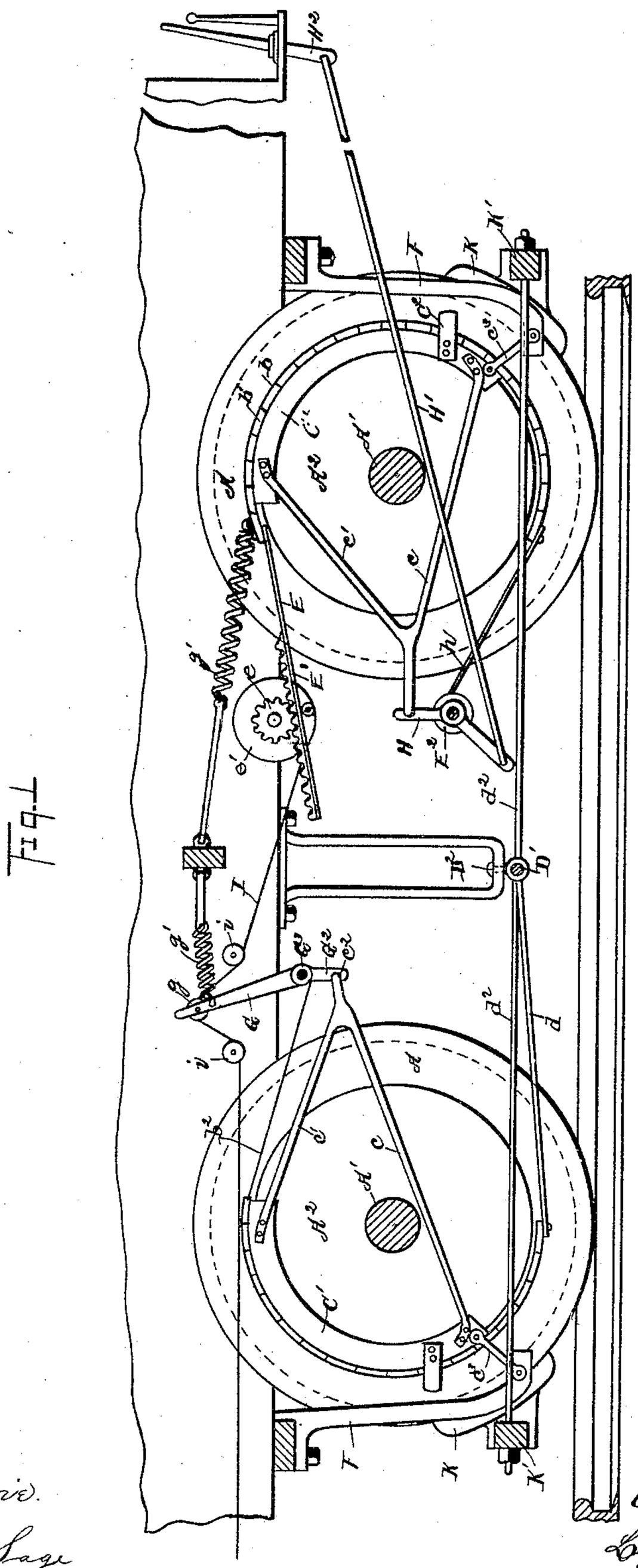

FIG. 1.

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Fig. 2

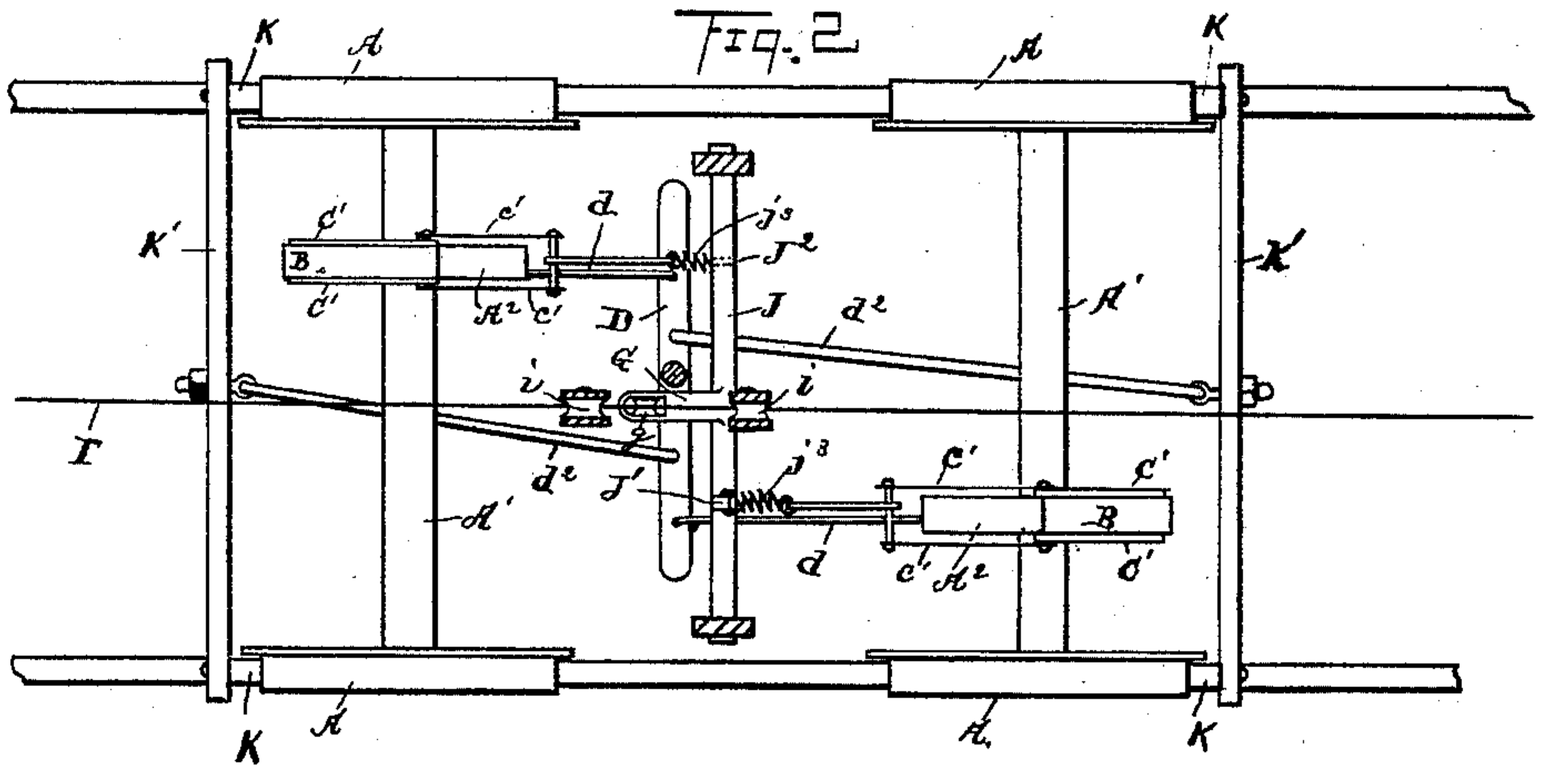


Fig. 4

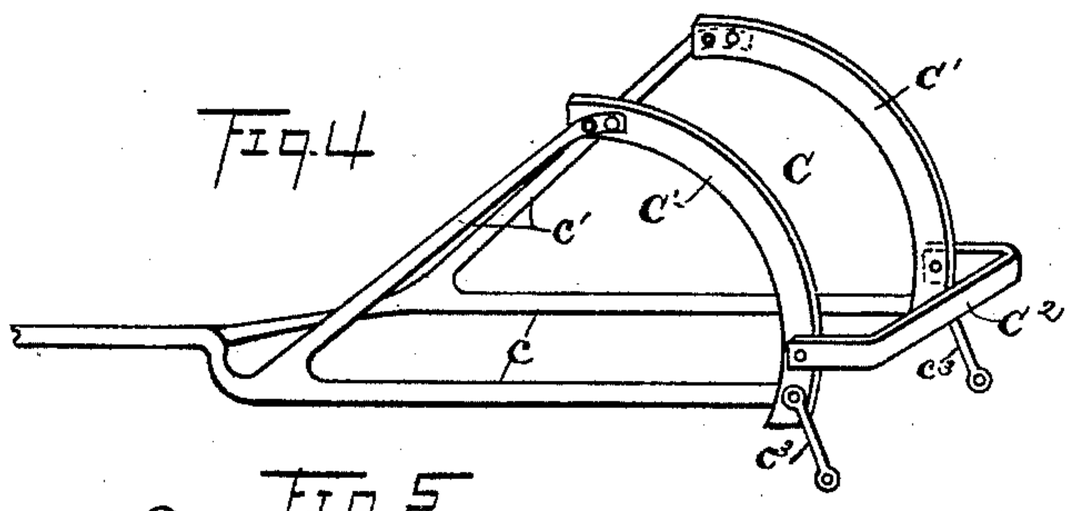


Fig. 5

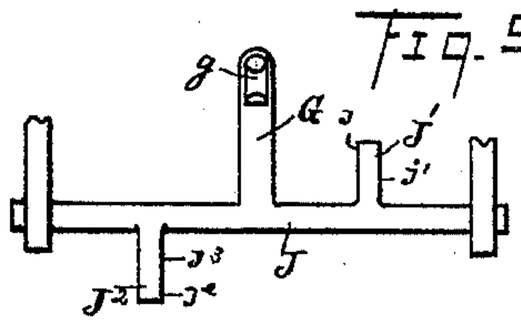


Fig. 6

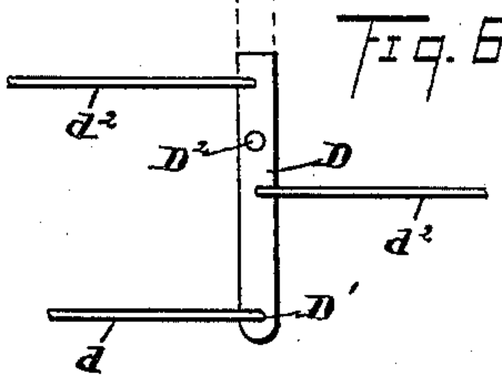
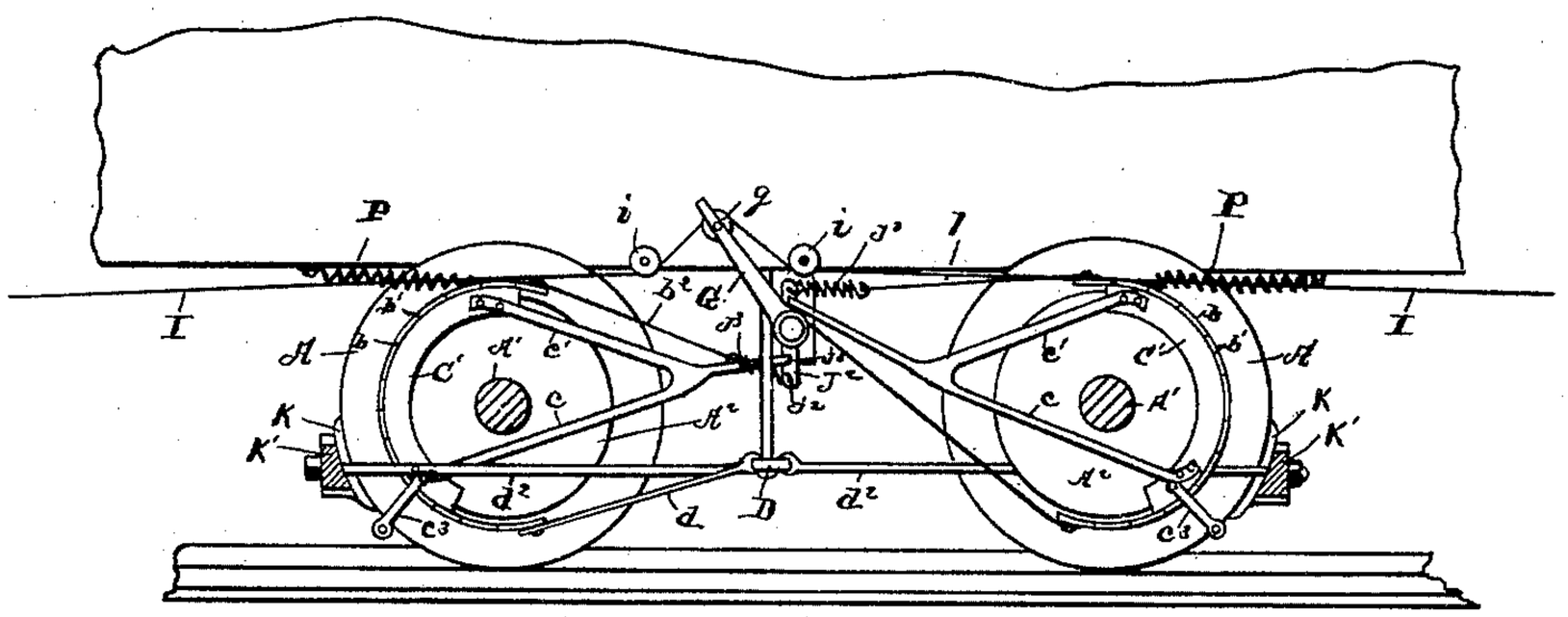


Fig. 3



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UNITED STATES PATENT OFFICE.

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BRAKE MECHANISM FOR CARS.

SPECIFICATION forming part of Letters Patent No. 430,500, dated June 17, 1890.

Application filed November 18, 1889. Serial No. 330,914. (No model.)

To all whom it may concern:

Be it known that I, ALLEN J. WRIGHT, of 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 pertains to make and use the same.

My invention relates to improvements in brake mechanism for cars; and it consists in certain features of construction and in combination of parts hereinafter described, and pointed out in the claims. Somewhat analogous mechanism, adapted more especially to a train of steam-cars, is made the subject of a separate application, Serial No. 330,914, for United States Letters Patent, bearing even date herewith. In this application the mechanism is shown more especially adapted to cable-cars or cars propelled by electric or other motors, although it may be applied to horse-cars.

In the accompanying drawings, Figure 1 is a side elevation partly in section. Fig. 2 is a plan taken below the car-body. Fig. 3 is a side elevation, partly in section, corresponding with Fig. 2. Fig. 4 is a perspective of frame C. Fig. 5 is an elevation in detail hereinafter described. Fig. 6 is a plan in detail.

A A represent the car-wheels, we will suppose, of a motor or grip-car that is supposed always to run the same end foremost.

A′ A′ are the car-axles, and A^2 A^2 are friction-wheels mounted on the car-axles.

B B are so-called "friction-bands" adapted, respectively, to engage wheels A^2. The outer member *b* of each friction-band is a band proper constructed usually of thin sheet metal, with a lining composed of transverse slats or shoes *b′*, usually metal, these shoes having concaved inner surfaces adapted to engage the faces of wheels A^2. The friction-bands are broad enough to overhang the faces of the co-operating friction-wheels A^2, and these overhanging sections of a friction-band are engaged by a movable frame C, adapted to lift the friction-band off the face of the wheel, one such frame being shown detached in Fig. 4.

The construction of frame C is as follows: Plates C′ are arranged in pairs astride a wheel A^2, the two plates of a frame being rigidly connected by means of yoke C^2. Rods *c c* and *c′ c′* are rigidly secured to the respective plates C′ near the extremes thereof, and these rods are connected at the converging ends thereof in any suitable manner, and these rods on the left-hand frame are pivoted at c^2 to lever G, and the rods of the frame on the right hand are pivoted to a bell-crank lever, hereinafter described. The friction-band on the left hand is for setting the brakes on this car, and the friction-band on the right hand is mainly for operating a reel on which a cord is wound, by means of which cord the brake on this car or other connected cars are controlled. I will first describe the mechanism connected with the left-hand friction-band, whereby the brakes of this car are operated. As aforesaid, frame C connects at c^2 with lever G. This lever, together with the small drum g^3 and the depending rock-arm G^2, all connect with rock-shaft G′. Plates C′, near the lower extremes thereof, are pivotally connected with links c^3, these links in turn being pivoted at *f* to supporting-brackets F. By shifting lever G toward the left hand the connected frame C is backed off, so as to disengage the friction-band from the wheel. Meantime, and by the means of the inclined position of links c^3, as shown, the frame is lifted, so as to elevate the friction-band far enough to clear the top section of the friction-wheel. By reversing lever G frame C is reversed, whereby the friction-band is caused to engage the friction-wheel. The car is supposed to travel toward the right hand, and hence wheels A revolve in the direction of the arrow. The lower or draft end of this friction-band is connected by means of rod, chain, or belt *d* (and we will suppose the former) with lever D at D′. This lever is fulcrumed at D^2, and on either side of the fulcrum of this lever are attached rods d^2 d^2, leading in opposite directions and connecting with the respective brake-bars K′, to which bars are attached the brake-shoes K in the usual manner. The brake beams, shoes, and connected mechanism are of ordinary construction, including links and springs (not shown) for supporting

the brake-beams and backing the brakes away from the wheels. Cord b^2 connects with the upper end of this friction-band, this cord being attached to and wound around drum G^3 aforesaid in the direction shown. In shifting lever G to separate the friction-band from the wheel cord b^2 is slacked off to loosen the friction-band. In reversing lever G the cord is tightened and in turn tightens the friction-band, so that the latter revolves a short distance with the friction-wheel, and in so doing applies the brakes. The friction-band also serves as a brake in helping to check the momentum of the car. Lever G at the upper extreme thereof is provided with sheave *g*, over which passes cord I, this cord passing under sheaves *i i*, the latter being located, as shown, on either side of the lever and on a plane lower than sheave *g*. The left-hand end of the cord is supposed to be fastened, and by drawing on the right-hand end of the cord lever G is shifted from the position shown in dotted lines to the position shown in solid lines. When cord I is loosened, lever G reverses by the action of spring *g'*, and the springs of the brake-beam also aid in reversing the intermediate mechanism, brake-band, &c.

The friction-wheel, friction-band, and frame C, located on the right hand, as shown in Fig. 1, are constructed in the manner already described. The principal service of this friction-band is in operating a reel on which cord I is wound, and by means of which the cord is tightened or loosened in operating the brakes of this or of other cars that may be connected. To this end the upper or draft end of the friction-band connects with rod E, the latter terminating in or connecting with a rack E', this rack engaging pinion *e*. On the same shaft with the pinion is mounted reel or drum *e'*, on which cord I winds in the direction shown, and by means of which reel the cord is tightened or loosened in operating lever G, and if the cord be extended to other cars it can be made simultaneously to operate other similar levers in operating the brakes of the other cars. Spring *g'* reverses this friction-band when the latter is loosened. For shifting the right-hand frame C the latter connects with the upright arm of bell-crank lever H, the latter being pivoted at the elbow thereof, as shown. The other arm of the bell-crank lever connects with rod H', this rod leading to and connecting with hand-lever H^2, this lever being located at the forward end of the car, where it is within easy reach of the operator. By moving this hand-lever forward the friction-band is disengaged from the wheel. By reversing the lever the friction-band is made to engage the friction-wheel. For tightening this friction-band is provided cord *h*, the latter connecting with the lower end of the friction-band, the other end of the cord being connected with and wound around drum E^2 in the direction shown, this drum being connected with and actuated by the movement of the bell-crank lever E aforesaid. In backing off the friction-band cord *h* is slacked off, thus loosening the friction-band. In reversing the hand-lever, whereby drum E^2 is reversed, cord *h* is tightened, thereby tightening the friction-band and causing the latter to revolve a short distance with the friction-wheel, thereby actuating the reel on which cord I winds.

On street-railways provided with loops or turn-tables, whereby the motor or grip-car is always run with the same end of the car forward, still the other cars that are drawn by such motors or grip-cars are likely to run either end forward, and hence the brake mechanism on these cars must be arranged accordingly, such arrangement being shown in Figs. 2 and 3, and may be substantially as follows: Each axle of the car is provided with friction-wheel A^2, and each friction-wheel is provided with a friction-band B and frame C, constructed as aforesaid, one of these friction-bands being arranged to operate the brake mechanism when the car is running in the one direction and the other friction-band being arranged to operate the brake with the cars running in the other direction, the one friction-band or the other always remaining idle, so far as setting the brakes is concerned. To this end J is a rock-shaft, to which is attached rock arm or lever G, the latter being substantially as heretofore described, the same being operated by cord I. The rock-shaft has also rock-arms J' and J^2, the former extending upward and the latter downward from the shaft. Frame C on the left hand connects with arm J' at *j'*, and to this rock-arm at *j* is attached springs j^3, the latter connecting with rod or cord b^2 of the right-hand brake-band. The frame C on the left hand connects with arm J^2 at j^2, and cord b^2 of the left-hand brake-band connects with spring b^3, that in turn connects with arm J^2 at j^3. The lower or draft end of each friction-band is respectively connected by means of chain, cord, or link *d* with lever D at D^2 in the manner shown in Fig. 6, including the prolongation of this lever shown in dotted lines, and from lever D lead rods d^2, connecting with the brake-beams K', in the manner already described.

P P' are springs connecting, respectively, with the brake-bands above and extending in opposite directions and attaching to the car for reversing these brake-bands. If the car be moving toward the right hand in moving lever G to the left hand, both cords b^2 and their attached spring b^3 will draw on the respective friction-bands; but such draft on the right-hand friction-band being applied for the time being to the draft end thereof spring b^3 of this friction-band yields a little, and there being nothing to take up the slack at the lower end of this band the latter slides on the friction-wheel and is inoperative so far as setting the brakes, but whatever friction is caused thereby helps to check the mo-

mentum of the car. The brake-band on the left hand being tightened by cord b^2 and spring b^3, connecting with the loose end of this brake-band, the latter is made to grasp the friction-wheel and turn with the wheel the limited distance necessary in setting the brake. If the car were moving in the opposite direction, the right-hand friction-band would set the brakes in like manner, and the left-hand friction-band would then be inoperative, and it will be observed that the lever G may be shifted by drawing on either end of cord I, provided the other end is made fast. Hence by the mechanism shown in Fig. 1 the reel may operate cord I, so as to set the brakes on any number of attached cars, and if these cars are changed so as to run in the opposite direction the brakes will be still set by the same mechanism.

I may add that if the friction-band at the right hand in Fig. 1 has sufficient power for the purpose a cable or other attachment might be applied to this friction-band in place of rod, and such rod or cable might lead, for instance, to the next car and be attached to the ordinary brake mechanism thereon, the same as the chain leading from the ordinary hand-winch of street-cars is attached to the lever that operates the brakes, as heretofore used. Such attachments for connecting the brake-band at the right hand in Fig. 1 with ordinary brake mechanism of other cars is not shown; but any ordinary mechanic familiar with the brake mechanism of ordinary street-cars would have no difficulty in making such connection.

Various modifications may be had without departing from the purpose and spirit of my invention. For instance, if, as is likely to be the case on electric-motor cars, there is not room on the car-axles for the friction-wheels hereinbefore mentioned, another axle or shaft might be employed for the purpose, such axle or shaft being intergeared or operatively connected with one of the car-axles.

What I claim is—

1. In brake mechanism for cars, the combination of car-axle, friction-wheel mounted thereon, friction-band adapted to engage such friction-wheel or be disengaged therefrom, and reel operatively connected with the draft end of such friction-band, substantially as set forth.

2. In brake mechanism for cars, in combination, car-axle, friction-wheel mounted thereon, friction-band adapted to engage such friction-wheel, reel operatively connected with the draft end of such friction-band, and cord engaging such reel, such cord being adapted to operate the brake mechanism of the same or other cars, substantially as set forth.

3. In brake mechanism for cars, in combination, car-axle, friction-wheel mounted thereon, and friction-band adapted to engage such friction-wheel, the draft end of such friction-band being operatively connected with the car-brakes, the loose end of the friction-band having attachment, substantially as indicated, for tightening such friction-band, substantially as set forth.

4. In brake mechanism for cars, in combination, car-axle, friction-wheel mounted thereon, and friction-band adapted to engage such friction-wheel, the draft end of such friction-band having suitable attachments adapted to connect with and operate brake mechanism of the same or other car, substantially as set forth.

In testimony whereof I sign this specification, in the presence of two witnesses, this 10th day of October, 1889.

ALLEN J. WRIGHT.

Witnesses:
C. H. DORER,
ALBERT E. LYNCH.