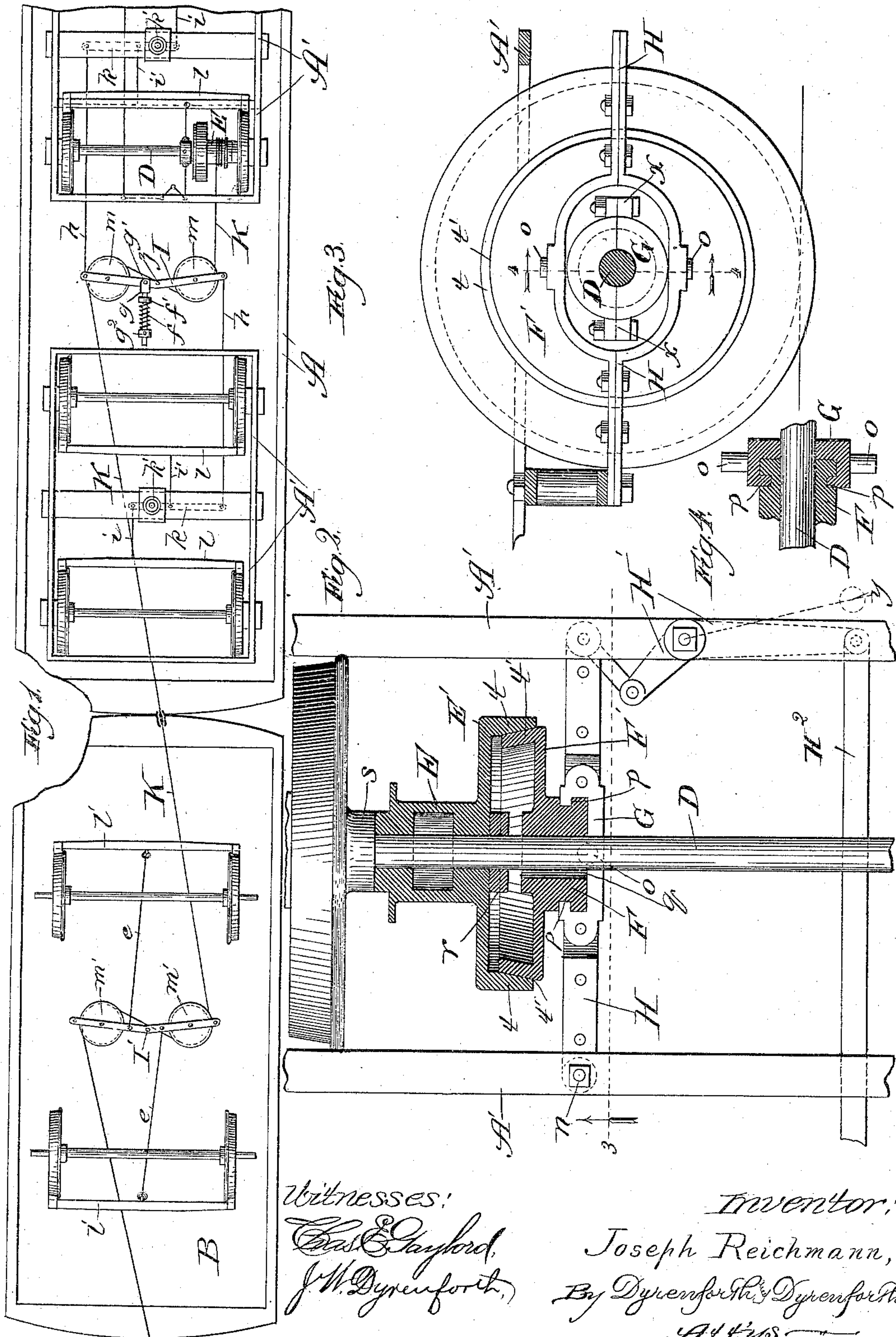


(No Model.)

J. REICHMANN.
CAR BRAKE.

No. 445,733.

Patented Feb. 3, 1891.



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UNITED STATES PATENT OFFICE.

JOSEPH REICHMANN, OF CHICAGO, ILLINOIS.

CAR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 445,733, dated February 3, 1891.

Application filed December 26, 1888. Renewed November 5, 1890. Serial No. 370,406. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH REICHMANN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Car-Brakes, of which the following is a specification.

My invention relates to an improvement in mechanism for setting and releasing the brakes of cars; and it has especial reference to mechanism for operating the brakes of cable-railway cars.

The object of my invention is to provide brake-operating mechanism of improved construction, whereby a car or train of cars may be stopped quickly without undue abruptness, and whereby separation of one or more cars from a train shall operate to set the brakes.

To this end my invention consists in the general construction of my improved brake-operating mechanism, and also in details of construction and combinations of parts.

The accompanying sheet of drawings illustrates my improved brake-operating mechanism as applied to street-cars of patterns at present in use, and I shall only describe my improvements in connection with cars constructed as shown, as it would require only modifications which would suggest themselves to persons skilled in the art to adapt my improvements to cars of any description.

In the drawings, Figure 1 illustrates a broken top plan view showing the trucks and side frames of a train of two cars representing a portion of a "grip-car" and a "trail-car" provided with my improvements; Fig. 2, a similar enlarged view of a portion of one of the trucks of the grip-car, showing improved clutch and other mechanism in section and other details of the brake-operating device; Fig. 3, a section on the line 3 of Fig. 2 and viewed in the direction of the arrow, and Fig. 4 a section on the line 4 4 of Fig. 3 and viewed in the direction of the arrows.

A is an eight-wheel forward or grip-car, mounted on center-bearing truck-frames A', and B is a trail-car, which may be detachably secured to the car A by means of any suitable coupling mechanism, which, however, is omitted from the drawings to avoid obstructing parts more necessary to illustrate in the

present connection. The axles of the car A revolve with the wheels, and the brake-beams *l* are pivotally suspended from the body of the car to extend with their shoes normally out of contact with but adjacent to the treads of the wheels, all in a common manner.

On an axle D of the car A is a loose sleeve shaped to afford a drum E, and having an extension E' of larger diameter provided with an annular flange *t*, which tapers on its inner side, as shown. The sleeve E abuts at one end against the hub *s* of the car-wheel, and is secured against lateral play by a collar *r*, which surrounds and is fixed to the axle. The sleeve affording the drum E and part E' being loose upon the axle D is normally unaffected by rotation of the latter.

F is a sleeve, also loose upon the axle D, and having an enlarged hollow extension F', the flange *t'* of which fits inside the tapering part *t*. A feather *q*, rigid upon the shaft D, fits a groove in the sleeve F, preventing the said sleeve from turning independently of the axle, but permitting it to be slid back and forth longitudinally of the latter. The outer tapering side of the flange *t'* and inner tapering side of the flange *t* afford friction-surfaces, and the former is of a size which permits it to enter the flange *t* and bear with its friction-surface against the friction-surface of the latter and afford a clutch, the clutch effect being controlled by the power exerted to press the parts together. In the reduced portion of the sleeve F is an annular groove *p*, and G is a flanged loose collar, which surrounds the axle D and fits into the annular groove *p*. The collar G is formed in two parts, which are bolted together, as shown at *x x*, and is provided with two radial studs *o* on opposite sides of its periphery.

H is a lever comprising two parts bolted together toward opposite ends, and toward its middle surrounding the collar G, and perforated to receive the studs *o*. At one end *n* the lever H is fulcrumed to the frame A' and at its opposite end to a crank-lever H', operated by a longitudinally-reciprocal rod H², which should be connected with the ordinary lever mechanism (not shown) at the forward end of the car and directly under the control of the operator. The long arm of the crank-lever H' is normally in the position of the

dotted line y , wherein the clutch formed by the flanges $t t'$ is released. To produce the clutching effect, the rod H^2 is operated to draw upon the crank-lever H' , which forces the lever H and sleeve F toward the sleeve E , causing the flange t' to enter and engage the flange t . When the car is moving, the part F revolves with the axle D , the drum E remaining normally stationary. When, however, the parts are forced together to produce the clutching effect, the drum E is caused to revolve with the axle.

The construction of clutch thus described affords one of various mechanisms that may be employed to actuate my shifting or pivotal sheave device hereinafter described, and for cable-car purposes especially is very desirable. On steam-cars, however, I should employ an entirely different mechanism, with the drum independent of the axle but necessarily like that shown, held yieldingly when turned to wind the rope and set the brakes.

I is a sheave arrangement comprising pulleys $m m$, supported at opposite ends of a continuous or divided bar pivoted at its middle z to the body of the car. A rope K , Fig. 1, is secured at one end to the drum E , around which it should be wound, as shown, and passes thence around the pulleys $m m$ of the sheave arrangement I , as shown, and extends to the rear end of the car, the rope being thus maintained out of a straight line between the points of fastening it.

On each truck-frame A' , midway between the brake-beams l , is the lever k , fulcrumed, as usual, to the bottom of the car at k' , and having one arm longer than the other. A pivotal rod i extends from the end of the short arm of the lever to one of the adjacent brake-beams l , and another pivotal rod i' extends from a point equally distant from the fulcrum k' on the long arm of the lever to the other adjacent brake-beam. Pivotal rods h connect the opposite ends of the sheave-bar with the long arms of the levers k .

When there are no trail-cars B or the trail-cars are not provided with my improved brake-operating mechanism, the free end of the rope K should be fastened toward the rear end of the car A .

The operation of my improved mechanism to stop a moving car is as follows: The ordinary brake-lever (not shown) is operated to draw the rod H^2 , and, as before described, cause the part F' of the clutch to engage with the part E' , whereby the drum E turns with the axle D , winding up the rope K . The effect of drawing upon the rope K is to cause the sheave device I to turn or shift on its pivotal support in the direction which would bring its end nearest the drum toward the latter and cause the levers k , through the medium of the rods h , to be drawn toward the sheave device. This turning of the levers k causes the rods $i i'$ to force the brake-shoes on the brake-beams l against the wheels. Pref-

erably each trail-car B , of which any desired number may constitute the train, is provided between its axles, as shown, with a sheave arrangement I' , similar to the sheave arrangement I , pivoted at its middle to the car-body and having pulleys $m' m'$, similar to the pulleys $m m$. A rope K extends from the forward end of the car around the pulleys m' , as shown, to the rear end of the car. At its opposite ends the rope is provided with means for readily coupling it between cars, and when thus coupled together it constitutes practically a continuous rope secured at one end to the drum E , and extending in the same direction around the pulleys of each pivotal-sheave arrangement on each car to the end of the train. It is, of course, necessary to secure the rope at the end of the train to prevent its being drawn through without turning the sheave devices.

In setting the brakes of a train of cars the rope, as it is wound upon the drum E , draws against all the sheaves simultaneously, whereby all the brakes are set at once and with equal force. To release the brakes, the clutch is disengaged, as aforesaid, and the rope allowed to unwind itself from the drum. As the mere weight of the brake-beams in their tendency to swing back may not be sufficient in itself to unwind the rope from the drum and release the brakes, I provide brake-releasing mechanism, which may be a suitable weight or spring mechanism, and if the latter it comprises, preferably, a rod g , pivoted to the bar of the sheave arrangement I at g' , and extending with its opposite end passing loosely through the bearing of a rigid hanger g^2 , suspended from the bottom of the car. On the rod g is a rigid collar f' , and between this collar and the hanger g^2 and bearing at opposite ends against them is a helical spring f , of sufficient resilient power, when compressed, to release the brakes. The same releasing mechanism may be provided on each car. As the sheave device I is turned, as aforesaid, to set the brakes, the pivoted rod g is forced backward through the hanger g^2 , and the spring f is compressed. When the clutch is released, the spring f expands and forces the sheave device to its normal position, thereby unwinding the rope from the drum and at the same time releasing the brakes. It will readily be seen that for the rope or cable K a chain or rod and rope arrangement, &c., might be substituted; but I desire to embrace under the term "rope" any form of cable which may be used for the purpose.

The adjustment throughout a train of cars of the practically-continuous rope in the same direction around the two pulleys of each sheave device, (meaning the adjustment whereby the section of rope of one car extends from the pulley on one end of the sheave device on that car toward the pulley on the opposite side of the sheave device on another

car,) and which produces the diagonal extension shown with reference to the sides of the cars of the rope, is necessary for a train of cars in order that the sections of rope on each car may extend to about the centers of its opposite ends and thus enable readily the sections of the single continuous rope to be coupled between cars, notwithstanding any change in the order of the cars with reference to each other in making up a train.

In addition to the advantage afforded by my improved mechanism for setting brakes by winding up the cable, it affords that of causing the brakes to be set automatically in case of separation of a car or cars in a train. Thus if for any reason the train becomes separated the clutch device, not being rigid but being frictional, enabling it to be turned backward under the influence of sufficient strain, will yield to the pulling strain of the rear separated portion of the train, and thus prevent breaking of the cable by enabling it to pay out, and the strain upon it will actuate the sheave devices to set the brakes.

While it is preferred that the sleeve arrangement shall have the pulleys on opposite ends of a pivotally-supported bar, inasmuch, however, as the purpose of the arrangement is to procure any manner of shifting of the pulleys to permit the rope to tend to straighten, I desire to include as within my invention any arrangement of the pulleys whereby, with the rope passed around them in the manner shown, to form an open loop around each, they may be caused to shift in pulling the rope, or the rope may be strained from its normal position toward a straight line without being caused to assume a straight line, the all-important advantage obtained by my invention being that of providing means which prevent the rope passing over the pulleys in the manner described from forming a straight line between the points at which it is secured, or between which it extends. In other words, I desire to be understood to include as within my invention all manners of applying a rope to the brake mechanism of a car or train of cars to operate the brakes by causing the rope to pass between its fastened extremities over pulleys in a manner to form an open or

partial loop on each pulley, according to the arrangement of the latter, each sheave device being directly connected with the brake mechanism which permits to it a limited motion, so that when force is applied to the rope motion is simultaneously imparted to each pulley and the parts connected therewith.

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

1. In combination with the brake mechanism of a train of cars, a rotary drum held yieldingly against reversal of its rotation, a sheave device on different cars of the train, each having its pulleys supported and movable on opposite sides of a straight line longitudinal of the respective car, and a rope secured at one end to one car of the train and at its opposite end to the drum and passed between its ends directly to and in the same direction around the pulleys of each sheave device and forming an open loop around each pulley, whereby when force is applied to the rope each pulley will be moved by a single length of rope and separation of the train will cause the rope to pay out by rotation of the drum against its yielding resistance and set the brakes, substantially as described.

2. In combination with the brake mechanism of a car, a sheave device, a rotary drum, a rope secured to the drum and extending therefrom around the sheave device and fastened at its free end, and releasing mechanism, substantially as described, for the brakes, substantially as set forth.

3. In combination with the brake mechanism of a car, a pivotal sheave device I, normally controlled by a spring-actuated rod *f*, an axle D, carrying a drum and a friction-clutch, lever mechanism connected with the clutch to produce and release at will engagement thereof with the drum, and a rope K, secured at one end to the drum and passing thence around the sheave device and fastened at its opposite end, substantially as described.

JOSEPH REICHMANN.

In presence of—

M. J. BOWERS,

J. W. DYRENFORTH.

It is hereby certified that in Letters Patent No. 445,733, granted February 3, 1891, upon the application of Joseph Reichmann, of Chicago, Illinois, for an improvement in "Car-Brakes," an error appears in the printed specification requiring the following correction, viz.: In line 25, page 3, the word "sleeve" should read *sheave*; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed, countersigned, and sealed this 3d day of March, A. D. 1891.

[SEAL.]

CYRUS BUSSEY,
Assistant Secretary of the Interior.

Countersigned:

C. E. MITCHELL,
Commissioner of Patents.