

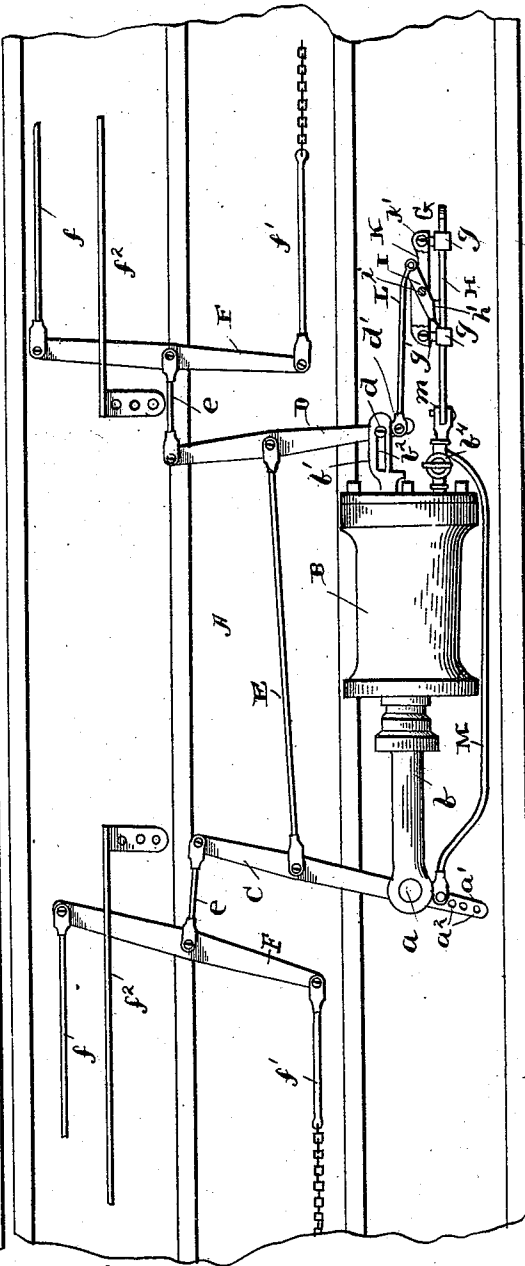
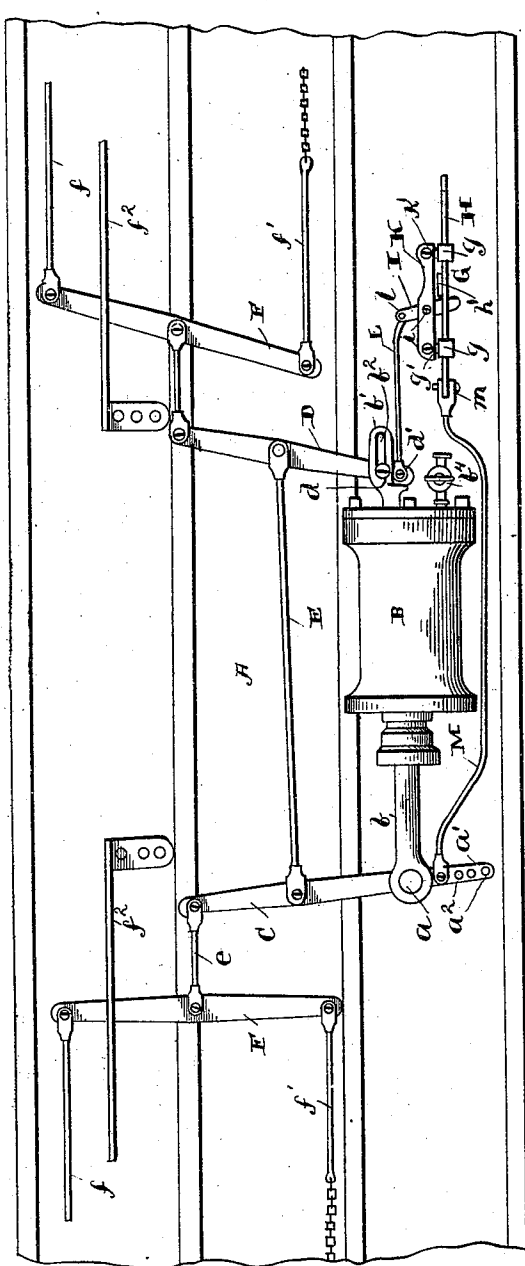
(No Model.)

3 Sheets—Sheet 1.

A. B. ROTE.
CAR BRAKE.

No. 501,103.

Patented July 11, 1893.



WITNESSES:

Ella L. Gerhart.
Geo. A. Lane.

INVENTOR

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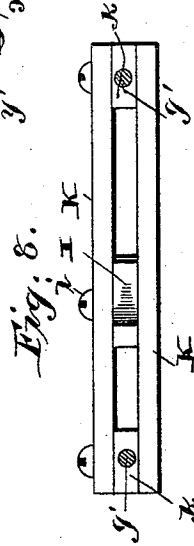
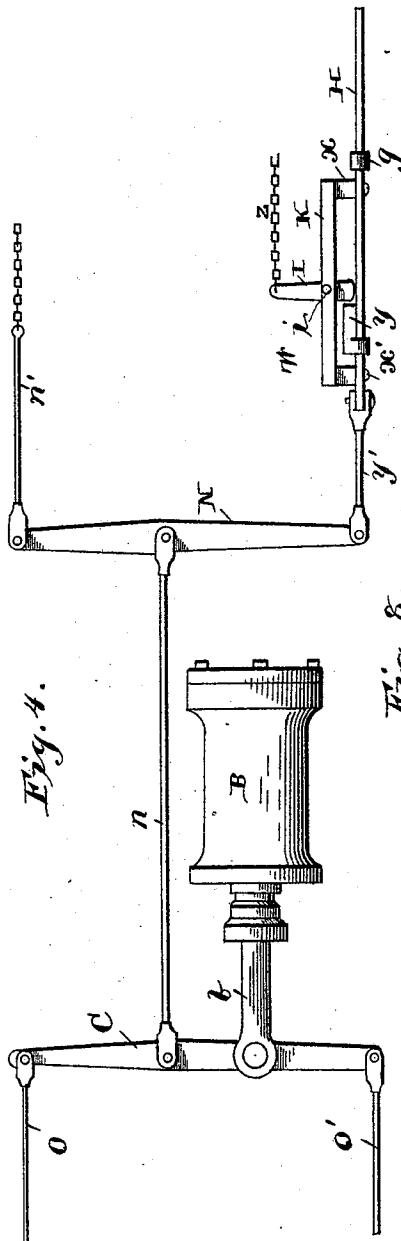
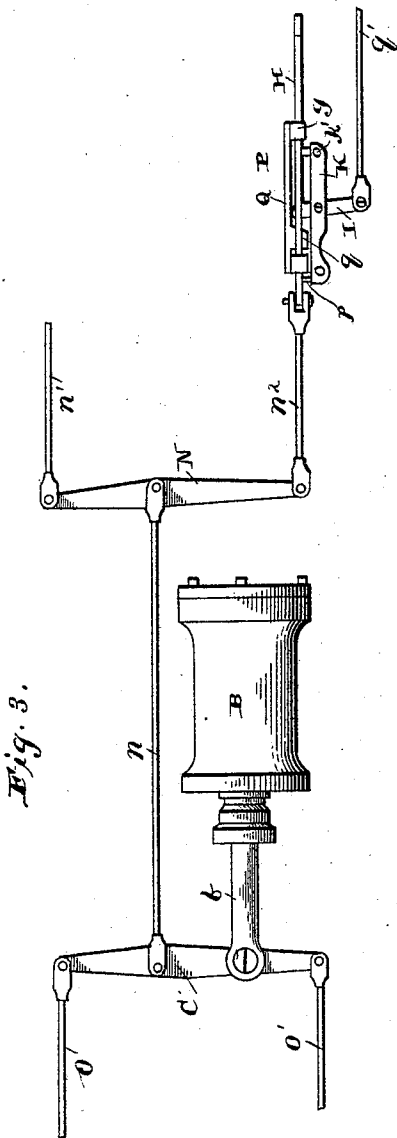
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Fig. 5.

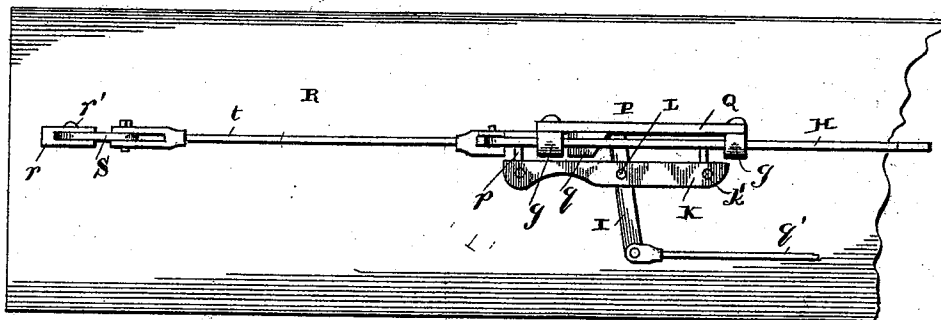


Fig. 6.

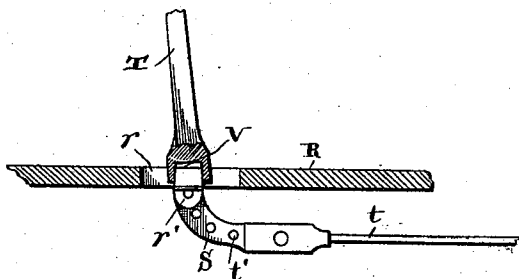


Fig. 7.

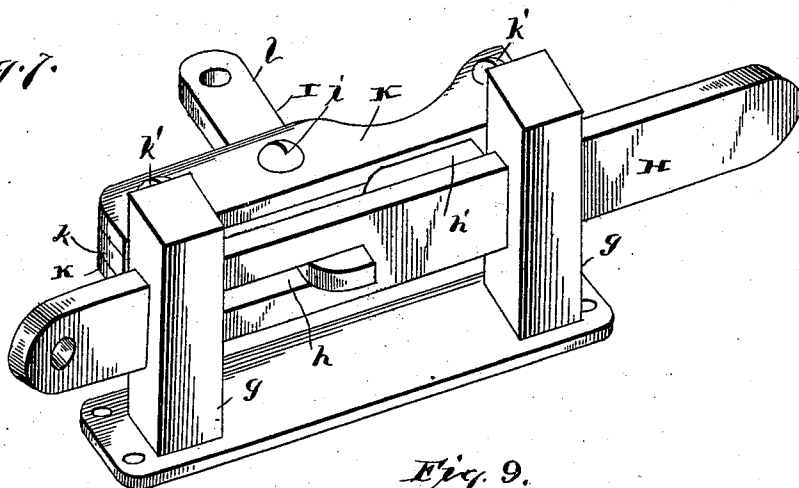
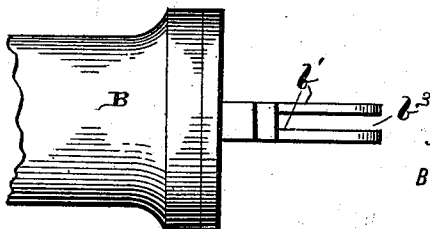


Fig. 9.



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UNITED STATES PATENT OFFICE.

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CAR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 501,103, dated July 11, 1893.

Application filed September 19, 1892. Serial No. 446,311. (No model.)

To all whom it may concern:

Be it known that I, ANDREW B. ROTE, a citizen of the United States, residing in Lancaster, in the county of Lancaster and State of Pennsylvania, have invented certain Improvements in Car-Brakes, of which the following is a specification.

This invention relates to improvements in that class of brakes employed on railway cars of various kinds; and the object of the improvement is to actuate the levers operating the brake-bars more effectively than is done in the systems now in use. With the present arrangement of levers in air-brakes the stroke of the piston-rod connected therewith is so long that it is difficult to keep up the supply of air when a train makes frequent stops, as is the case with way trains near large cities, while with street-cars the construction is such that the length of time required to tighten the shoes upon the wheels is so great as to much impair the brakeman's control of the cars, especially with the speed at which they run when operated by electricity.

My invention consists in the combination, with the levers connecting the power and the brake-bar, of an interposed device to facilitate the movement of the lever actuating the brake-bar with each application of the power.

My invention further consists in the combination, with the brake levers connecting the brake cylinder of an air-brake and the brake-bars, of a device for automatically moving the fulcrums of both the brake levers to increase or diminish the distance between said fulcrums with each application of power.

My invention consists, finally, in the combination, with the brake-levers connecting the brake cylinder of an air brake and the brake-bars, of a device for automatically moving the fulcrums of both the brake levers to regulate the distance between said fulcrums, and an interposed device to facilitate the movement of the levers actuating the brake-bars with each application of power.

I accomplish the object of my invention by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a bottom plan view of the central portion of a passenger-car having my improved brake-actuating mechanism applied thereto, showing the position of the parts when the brakes are disengaged from the

wheels, and Fig. 2 a similar view, showing the position of the parts when the brakes are applied to the wheels, a portion of one of the plates being cut away. Fig. 3 is a bottom plan view of my brake-actuating mechanism as applied to a freight car, and Fig. 4 a modification of the same. Fig. 5 is a bottom plan view of the same mechanism as applied to a street car, and Fig. 6 a side view of the hand-lever attachment of the same, shown in an upright position. Fig. 7 is an enlarged perspective view of the take-up device, and Fig. 8 a similar inner edge view of the plates in which the take-up lever is fulcrumed. Fig. 9 is a side view of the bracket on the end of the brake cylinder. The bottom of a car is shown only in the first two and the fifth figures, as it is not further necessary to a correct illustration and description of the invention.

Similar letters indicate like parts throughout the several views.

As the invention relates solely to the brake-actuating mechanism and not to the construction of the brakes themselves, nor to the form or construction of the car and trucks to which such brakes may be applied, the latter features will not be described and are not shown in the drawings.

Referring to the details of the drawings, A represents the bottom of a car to which air brakes are applied; B, the brake-cylinder; b, the piston-rod; C, a brake lever fulcrumed in the end of the piston-rod, and a, the bolt forming the fulcrum of lever C.

In Figs. 1 and 2 there is a cock b^4 and a bracket b' shown on the end or head of brake cylinder B opposite to that from which the piston-rod projects. The bracket b' is provided with a horizontal slot b^3 , engaged by an end of a brake lever D, the screw or bolt d , constituting the fulcrum, passing through vertical slots b^3 in the top and bottom of bracket b' and sliding longitudinally therein, as will be explained. Brake levers C and D are connected by a tie-rod E, and the outer ends of said levers are connected by rods e with floating levers F held in a horizontal position by brackets f^2 . One end of each of the floating levers F is again connected with the brake-bar levers by rods f and the other end with the hand-brake by rods f' .

Near and to one side of bracket b' is lo-

cated a "take-up" device G to facilitate the application of the brakes. This device consists of hangers *g*, through slots in which there slides a draw bar H, and on one side of the hangers there are horizontal plates K, having blocks *k* interposed between their ends, the plates and blocks being united by screws *k'*, and the blocks secured by bolts or pins *g'* to hangers *g*.

At *i*, between plates K, there is fulcrumed a "take-up" lever I, the inner end *l* of which is connected with the inner arm *d'* of brake lever D by a rod L. The other end of the "take-up" lever engages a slot *h* in draw-bar H.

On the inner face of the draw-bar and at one end of slot *h* there is secured a bearing-block *h'*, having the end adjacent to the "take-up" lever beveled to reduce the friction of its contact with said "take-up" lever, as shown in Fig. 7. The inner end of the draw-bar is engaged by jaws *m* of rod M, which connects the said bar with the arm *a'* of brake lever C, having a series of bolt-holes, *a²*, through it to allow an adjustment of its connection with rod M.

For the purposes of this specification the device to aid in taking up the brakes, just described, is termed the "take-up" device and the lever operated therein the "take up" lever.

In operating, the outward movement of the piston-rod, carrying with it lever C, draws the long ends of brake levers C and D together through their connection by the tie-rod E. This action causes arm *a'* of brake lever C to pull toward it the draw-bar H, which, acting on the end of the "take-up" lever engaged in slot *h*, thereof draws the fulcrum of brake lever D away from the brake cylinder B through the connection of the end *l* of the "take-up" lever with the arm *d'* of said brake lever D, as shown in Fig. 2. This action extends the distance between the fulcrums of brake levers C and D by moving both of them, thus drawing the ends of said levers connected with the brake-bar levers through the floating levers near enough together to apply the brakes by a comparatively short stroke of the piston-rod.

In the brake-actuating mechanisms now in use, the distance between the fulcrums of the levers located at the opposite ends of brake cylinder B is ordinarily increased by moving only the fulcrum of the brake lever, connected with the piston-rod away from said cylinder. This necessitates a long stroke of the piston-rod, requiring the consumption and consequent supply of a proportionable amount of air. My invention accomplishes the same result with each application of the power by a greatly reduced stroke of the piston and a consequent saving of air, the reduction in said stroke being regulated by the proportioning and adjustment of the various parts of the device.

There are take up devices employed where-by the increased stroke of the piston of the

brake-cylinder occasioned by the wear of the shoes of the brakes or the springing or bending of the parts connecting said brake-cylinder with the brakes, is reduced; but these devices are not applicable to the shortening of the stroke of the piston by taking up the normal slack of the brakes each time the power is applied to engage the brakes with the wheels.

In the application of air-brakes to freight-cars, shown in Fig. 3, the brake lever attached to the end of the brake cylinder opposite the piston-rod and the floating-lever interposed between the brake-lever fulcrumed in the piston-rod and the brake bar lever with which it is connected are omitted, the brake lever C, fulcrumed in the piston-rod, being directly connected with one of the brake-bar levers by rod O and with one of the hand brakes by rod and chain O'. The floating lever, N, secured to brake lever C by tie-rod *n*, has one end directly connected with the other hand-brake by rod and chain *n'* and the other with the draw-bar H by a rod *n²*. In this case, the "take-up" device P is somewhat different in construction from that shown in Figs. 1 and 2, but acts on the same principle. Here the plates K, in which the "take-up" lever is fulcrumed, are rigidly secured to the draw-bar on one side by pins or bolts *p*, and on the other side there is a plate Q secured to hangers *g* and having a bearing-block *q* formed therewith and extending through slot *h* of the draw-bar. One end of "take-up" lever I passes through said slot and the other is connected directly with a brake-bar lever by rod *q'*.

In operating, the outward movement of the piston-rod pulls the end of lever N, to which rod *n²* is pivoted, toward brake cylinder B, drawing bar H and the "take-up" lever with it, which actuates said "take-up" lever and applies the brakes through rod *q'*. The "take-up" device is only shown in connection with one of the brake-bar lever rods, but it is obvious that it can be applied in the same way to the other.

In Fig. 4, there is shown a modification in the construction of the "take-up" device as applied to freight-car brakes. With this "take-up," W, the plates K are rigidly secured to draw-bar H by screws or bolts, *x'*, passing through blocks *x*, connecting said plates and draw-bar; and a bearing *y* is placed adjacent to the inner hanger *g* and is adapted to be engaged by one end of the "take-up" lever, as the draw-bar is pulled toward brake cylinder B by lever N, connected with said "take-up" lever by rod *y'*, the other end of the "take-up" lever being connected with the brake-bar lever by chain *z*.

Figs. 5 and 6 illustrate the application of the "take-up" device to the brakes of a street-car. The "take-up" is constructed in the manner shown in Fig. 3, and is secured to the bottom R of the car, the brakes being actuated through rod *q'*. The "take-up" lever is operated by the hand-lever T, the lower end

of which has a socket V that takes over the upper end of a lever S, passing through an opening *r* in the bottom of the car and fulcrumed in brackets *r'*, bolted to the under side of said bottom. The lower end of lever S has a series of perforations *t'* to permit an adjustment of rod *t*, connecting it with the draw-bar.

Many changes and modifications can be made in the details of the devices herein described without departing from the spirit of my invention. I, therefore, do not limit myself to any particular construction by which the shifting fulcrum of the brake lever at the head or end of the brake cylinder opposite the piston-rod is supported; nor do I restrict myself to the particular construction and arrangement of the "take up" device herein shown and described; neither do I confine myself to the construction shown and described by which the brake-lever supported at the end of the brake-cylinder opposite the piston-rod is moved to and from that cylinder with each stroke of said piston-rod.

My invention involves a radical departure in the construction and principle of operation in brake-actuating mechanism, the invention consisting, broadly, first, in a brake-actuating mechanism provided with a "take up" device located between the brakes and the point of application of the power, whereby the "slack" of the brakes is taken up each time the power is applied to engage the brakes with the wheels, and, second, in the combination, with a brake-cylinder, of a brake-lever fulcrumed in the piston-rod of said cylinder, a second brake-lever having a shifting fulcrum, a tie-rod connecting said levers and a device to automatically move said shifting fulcrum from and toward the lever fulcrumed to the piston-rod as said piston-rod makes its outward and inward strokes.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with the brakes and a device for applying the brakes to the wheels, of a take up mechanism composed of a draw-bar connected with said device for applying the brakes and a take-up lever having one end connected with the brakes and the other end adapted to be actuated by the draw-bar, substantially as and for the purpose specified.

2. In a brake-actuating-mechanism, the combination, with the brakes and a device for applying the brakes to the wheels, of hangers affixed to the car, a draw-bar constructed to slide through slots in the hangers, a take-up lever fulcrumed in plates attached to the hangers and having one end engaging a slot in the draw-bar and the other end connected with the brakes, and a connection between the draw-bar and the device for applying the brakes to the wheels, substantially as and for the purpose specified.

3. In a brake-actuating-mechanism, the

combination, with a brake-lever fulcrumed to the piston-rod of a brake cylinder, of a second brake-lever having a shifting fulcrum, a device to automatically move said shifting fulcrum from and toward the lever fulcrumed to the piston-rod as said piston-rod makes its outward and inward stroke, a tie-rod connecting the brake-levers, and connections between said levers and the brakes, substantially as and for the purpose specified.

4. In a brake-actuating-mechanism, the combination, with a brake-cylinder, of a brake-lever fulcrumed to the piston-rod thereof, a bracket affixed to the end of said cylinder opposite the piston-rod and having vertical and horizontal slots, a brake-lever engaging the horizontal slot of the bracket and having its fulcrum pin passing through the vertical slot thereof, means for automatically moving the fulcrum of the brake-lever in the bracket from and toward the cylinder as the piston rod makes its outward and inward stroke, a tie-rod connecting the brake-levers, and connections between said levers and the brakes, substantially as and for the purpose specified.

5. In a brake-actuating mechanism, the combination, with a brake-lever fulcrumed to the piston-rod of a brake-cylinder, of a second brake-lever having a shifting fulcrum, a "take-up" lever, a draw-bar adapted to actuate the "take-up" lever, connections between an arm of each of the brake-levers and the brakes, a tie-rod connecting said arms of the brake-levers, a connection between the draw-bar and the other arm of the brake-lever fulcrumed to the piston-rod, and a connection between the "take-up" lever and the other arm of the second brake-lever, substantially as and for the purpose specified.

6. In a brake-actuating mechanism, the combination, with a brake-lever fulcrumed to the piston-rod of a brake cylinder, of a bracket affixed to the end of said cylinder opposite the piston-rod and having vertical and horizontal slots, a second brake-lever engaged in the horizontal slot of the bracket and having its fulcrum pin passing through the vertical slot thereof, a connection between the brakes and one of the arms of each of said brake-levers, a tie-rod connecting said arms, hangers affixed to the bottom of the car, a draw-bar adapted to slide through slots in the hangers, a "take-up" lever fulcrumed in plates attached to the hangers and having one end engaging a slot in the draw-bar, a connection between said draw-bar and the other arm of the brake-lever fulcrumed to the piston-rod, and a connection between the other arm of the second brake-lever and an end of the "take-up" lever, substantially as and for the purpose specified.

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Witnesses:

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