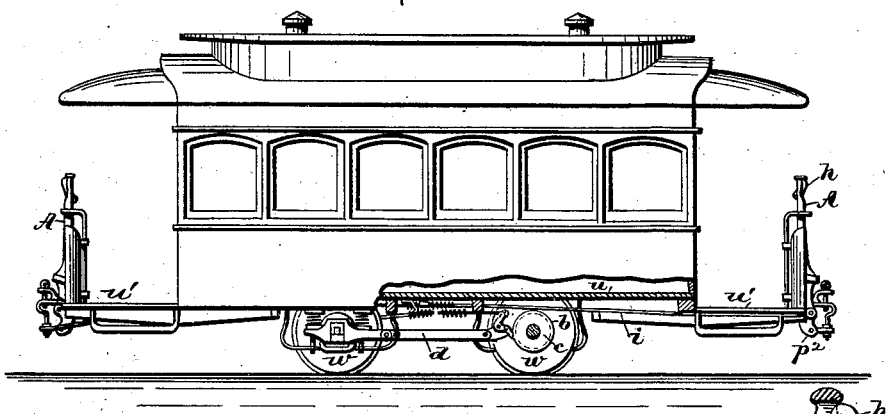
(No Model.) 2 Sheets—Sheet 1.

E. E. BAKER.

CAR BRAKE.

No. 381,978. Patented May 1, 1888.

FIG. 1.



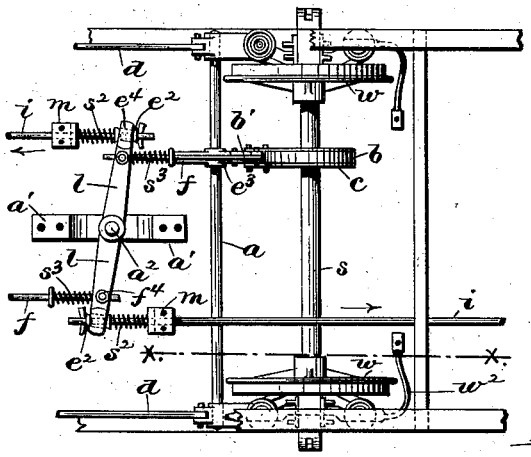
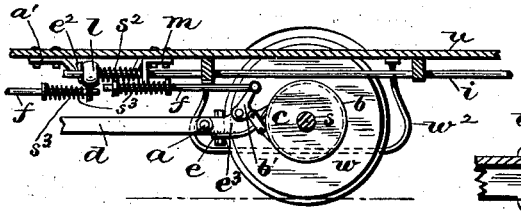


FIG. 2.



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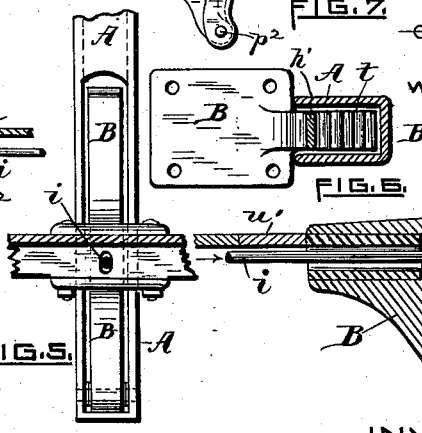

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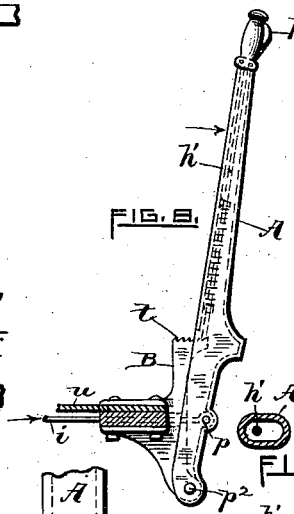

FIG. 8.

FIG. 7.

FIG. 6.

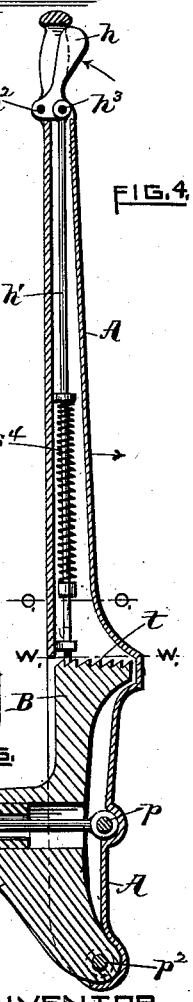

FIG. 4.

WITNESSES.

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(No Model.) 2 Sheets—Sheet 2.

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CAR BRAKE.

No. 381,978. Patented May 1, 1888.

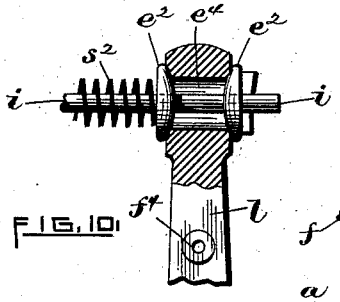

FIG. 10.

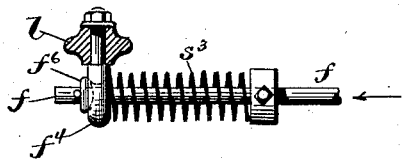

FIG. 11.

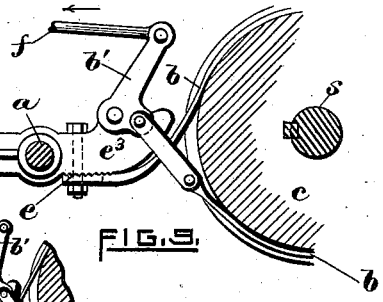

FIG. 9.

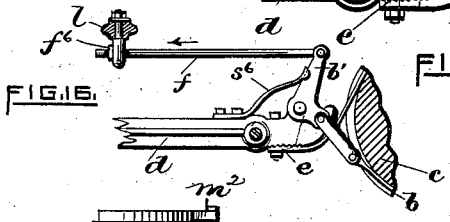

FIG. 16.

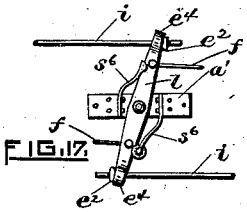

FIG. 17.

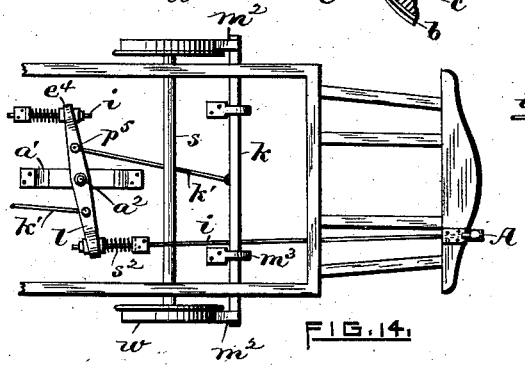

FIG. 14.

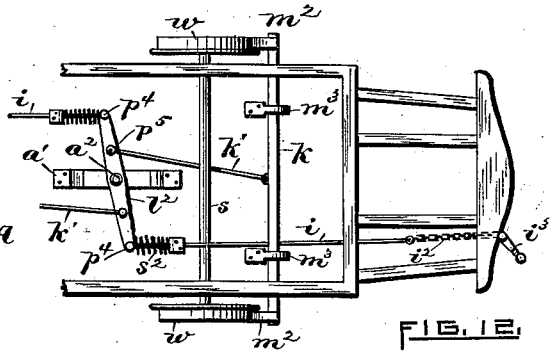

FIG. 12.

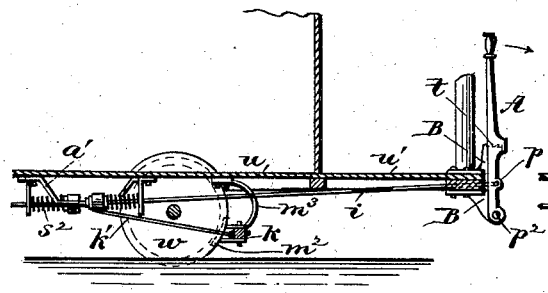

FIG. 15.

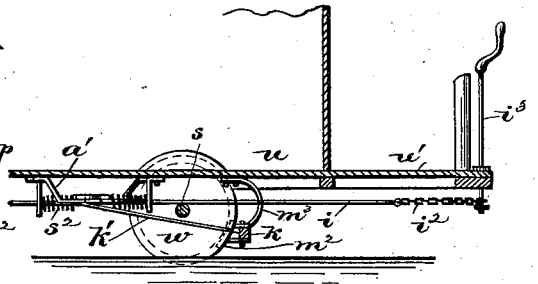

FIG. 13.

WITNESSES.

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UNITED STATES PATENT OFFICE.

ELIJAH E. BAKER, OF CAMBRIDGEPORT, MASSACHUSETTS.

CAR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 381,978, dated May 1, 1888.

Application filed August 5, 1887. Serial No. 246,216. (No model.)

To all whom it may concern:

Be it known that I, ELIJAH E. BAKER, a citizen of the United States, residing at Cambridgeport, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Car-Brakes; 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, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

My invention relates to car-brakes; and it consists, essentially, in the novel device for automatically taking up the "slack" of the several connections. Usually, heretofore, considerable time is consumed by the brakeman in the discharge of his duty in overcoming the slack of the brake-connections preparatory to the effectual application of the brake in stopping a car.

The primary object of the invention hereinafter claimed is to provide a car with means whereby the brakeman is enabled to instantly exert his power upon the brakes to stop its momentum.

In the accompanying two sheets of drawings my improvement is represented as applied to a street-car. It is obvious, however, that no additional invention would be required to apply it to a steam car, and I contemplate such use for it.

Figure 1, Sheet 1, represents a perspective view of a horse-car of ordinary construction as provided with my improved brake, a portion of the car being broken away to show the manner of connecting the brake-band with the brake-lever. Fig. 2 is a plan view of a portion of the running-gear of the car. Fig. 3 is a vertical transverse sectional view of the same, taken on line *x x*. Fig. 4 is an enlarged vertical sectional view taken through the center of the brake-lever. Fig. 5 is a partial rear view thereof. Fig. 6 is a horizontal sectional view taken on line *w w* of Fig. 4, showing the stationary brake-stand. Fig. 7 is a similar sectional view taken on line *o o*. Fig. 8 is a side view reduced, showing the brake-lever vibrated forward to its extreme position.

Fig. 9, Sheet 2, is an enlarged side view in partial section, showing the manner of applying the brake-band to the wheel and the means for attaching the ends of the band. Fig. 10 is a horizontal sectional view enlarged, taken through the center of the free end of the thrust-lever. Fig. 11 is a cross-sectional view of the lever, showing the attached brake-connection which connects directly with the bell-crank lever shown in Fig. 9. Fig. 12 is a plan view of a portion of a horse-car, showing the ordinary brake arrangement. Fig. 13 is a partial longitudinal sectional view of the same. Fig. 14 is a plan view showing my improvement applied to the usual brake-beam. Fig. 15 is a corresponding vertical sectional view taken longitudinally of the car. Fig. 16 is a partial side elevation reduced, showing a portion of the brake-band and its connections, and also showing a fixed flat spring bearing directly against the bell-crank lever in lieu of the spiral spring which in the other figures encircles the short pull-rod; and Fig. 17 is a plan view of the double-acting thrust-lever, corresponding substantially with that shown in Fig. 2, with this difference, however, that fixed flat springs are used, which bear against the lever to return it to its normal position, instead of employing spiral springs for the purpose.

A detailed description of my invention is as follows:

s indicates an axle of the car, having wheels *w* secured thereon, all constructed, arranged, and mounted in a truck beneath the floor *u* of a car, substantially as usual.

An iron plate, *a'*, Fig. 2, is secured to the under side of the car intermediate of the two axles, (as in street-cars,) to which is centrally pivoted at a^2 the horizontal thrust-lever *l*. *a* indicates a rod secured transversely in a frame immediately to the rear of each set of wheels *w*. Ties *d* on each side of the car serve to unite the rod-supporting frames. A brake-wheel, *c*, is secured to each axle intermediate of the car-wheels, the same being turned to receive a brake-band, *b*, one end of the latter being slightly corrugated, as at *e*, Figs. 3 and 9, and secured to a frame, e^3, by a bolt passing through an elongated hole in the band. By means of this construction the wear or "stretch" of the band may be taken up, as desired, the corrugations serving, in conjunction with said bolt, to maintain the band in position after adjustment. The other or free

end of the band is connected by links to a bell-crank lever, b', pivoted to the frame e^3. A short pull-rod, f, is jointed to the long arm of the latter lever, and extends rearwardly therefrom to and through an eyebolt, f^4, secured to the thrust-lever l, a spring, s^3, Figs. 9 and 11, interposed between the bolt f^4 and a fixed collar, (or as shown at s^6, Fig. 16,) serving to maintain the rod f normally stationary when the pressure is removed from the brake-band, &c.; but when pressure is applied the force is transmitted through the lever l to the bolt and against the loose collar f^6, the latter being held and resisted by a key or pin passing through the rod f, thereby causing the shortening of the band b. (See arrow direction.)

i indicates the long pull rod, having its forward end jointed to the main brake-lever A at the front end of the car. The rear end of the rod passes through a stationary guide, m, and through an elongated opening, e^4, formed in the outer end of the thrust-lever l. The edge of the lever is recessed on each side of said opening to receive the rounded-face washers e^2, loosely mounted upon the rod. The outer washer bears against a key passing through the rod, as clearly shown in Fig. 10. A spring, s^2, is mounted on the pull-rod intermediate of the inner washer and the guide m, said spring serving to assist in returning the brake-lever A and its connections to the normal position after the pressure is removed. (See also s^6, Fig. 17.) It is obvious now that upon the application of pressure to the opposite brake-lever the corresponding arm of the lever l will, through the medium of the pull-rod f and its connection, act to brake the car, while at the same time the other end of the said lever l will move rearwardly against the tension of its spring s^2, backed by the guide m, its rod i meanwhile remaining stationary, the enlarged hole e^4 permitting the lever to freely vibrate without springing the rod.

To the front end of the car a brake stand, B, is rigidly secured to the forward portion of the platform w', the location of said stand and the brake-lever about to be described being such as to permit the brakeman to have it under immediate and ready control. The brake-stand extends a short distance above the platform, its top surface having a series of ratchet-shaped notches, t, formed therein. Immediately below the platform w' the stand is provided with an elongated hole, through which the rod i passes. The lower portion of the stand terminates in the rounded end, and to which the hand brake-lever is pivoted at p^2.

A designates the hand brake-lever as a whole, the same being hollow and adapted to inclose the vertical portion of the brake-stand, as clearly shown in Fig. 4. The upper end of said lever is also made hollow and serves as a handle for the brakeman. A small lever, h, is pivoted at h^2 to the handle portion. h' indicates a vertical rod mounted within the brake-lever, its lower portion being made broad and adapted at its lower end to engage the notches t of the stand, before described, the upper end of this rod being jointed at h^3 to the lever h. s^4 is a spiral spring surrounding the rod for the purpose of normally maintaining the rod in engagement with the said ratchets. The forward end of the brake-rod i is jointed to the lever at p, as shown.

It is obvious now that a brakeman, in grasping the handle portion of the lever A, first closes his hand around the lever h, thereby moving the latter in the arrow direction, Fig. 4, and withdrawing the rod h' from the notches t. The brakeman then forces the brake-lever ahead a sufficient distance to effect the desired contraction of the brake-bands through the agency of its rod i, lever l, &c. By removing the pressure from the handle portion the spring s^4 instantly acts to force the rod h' into engagement with a corresponding notch of the brake-stand. It will be observed that this arrangement produces a simultaneous action upon the two axles, although at the same time unaffecting the position of the other brake-lever, A.

In Figs. 12 and 13 the ordinary form of brake is represented, k indicating the brake-beam, supported by bent arms m^3, secured to the under side of the car. The outer ends of the said beam carry the brake-shoes m^2, adapted to engage the car-wheels w. The thrust-lever l^2 is pivoted to a plate, a', as usual. The outer ends of the lever l^2 are jointed each, at p^4, to a brake-rod, i, which in turn is jointed to a short chain, i^2, connected with the lower end of the brake-operating handle and shaft i^3. k' indicates a link pivoted to the lever l^2 at p^5 and connecting with the brake-beam. It is obvious now that by axially turning the vertical shaft i^3, as in applying the brake, the chain will be wound around it, thereby shortening the connection and forcing the shoes m^2 into engagement with the car-wheels, the other chain and rod i at the same time being slack and free to vibrate in any direction.

In Figs. 14 and 15 the ordinary construction of the brake arrangement is retained, with the exception that the chain is dispensed with and the stationary stand B and hand-lever A being substituted for the vertical shaft i^3. I also construct the thrust-lever l at its outer ends to receive the brake-rod i, substantially as shown in Fig. 10, and for the purpose hereinbefore described. By this simple change I am enabled to convert an ordinary brake mechanism into one having my improvements, and at the same time retaining the brake-beam k, shoes m^2, and links k' of the old device.

It is obvious that flat springs s^6 may be used in lieu of the coiled springs s^2 s^3, as shown in Figs. 16 and 17, the springs in this case being so secured that the free ends thereof, which may also serve as guides, bear against their respective levers, thereby, when pressure is removed from the brakes, maintaining the levers in the normal position.

Having thus described my invention, I claim—

1. The combination, in a car-brake mechan-

ism, of a pivotally-mounted spring-retracting thrust-lever having pull-rods loosely mounted therein, adapted to move in unison with said lever and also adapted to move independently thereof, substantially as hereinbefore described, and for the purpose specified.

2. The combination, with brake-bands and brake-levers mounted and arranged substantially as herein described, of a pivoted thrust-lever, as *l*, having its free ends adapted each to freely receive a brake-rod, *i*, collars engaging the lever and loosely mounted on said rod, and springs also engaging the lever, for the purpose specified.

3. The combination, with a brake-wheel, a brake-band, and a pivotally-mounted spring-retracting thrust-lever, of a mounted brake-lever, as A, a pull-rod jointed thereto and having its other end loosely mounted in said thrust-lever, to travel in unison therewith when pressure is applied and adapted to move independently thereof when the pressure is released, and a pull-rod similarly mounted connecting the brake-band and thrust-lever, substantially as hereinbefore described.

4. The combination, with a mounted brake-wheel, an adjustably-secured band-brake therefor, and bell-crank lever *b'*, of the spring-retracting thrust-lever *l*, a pull-rod, *f*, mounted as described and jointed to the lever *b'*, a brake-rod, *i*, adapted to actuate the thrust-lever, &c., and a pivoted main brake-lever having the latter rod jointed thereto, substantially as shown and described.

5. In a car-brake, the combination of a stationary frame having a series of notches therein, a band-brake having an end thereof notched or corrugated to engage the notched frame, and a bolt passing through the band and frame to adjustably secure the band in position, substantially as described.

6. The combination, in a car-brake mechanism, of the brake-stand B, the hollow brake-lever A, pivoted thereto, a spring locking-catch mounted within said lever and engaging the brake-stand, a pull-rod jointed to the brake-lever, and a pivotally-mounted thrust-lever connected with a brake band and wheel, having the end of said pull-rod mounted therein so as to actuate the thrust-lever in one direction only, substantially as shown and hereinbefore described.

In testimony whereof I have affixed my signature in presence of two witnesses.

ELIJAH E. BAKER.

Witnesses:

CHARLES HANNIGAN,

JAMES B. ALLEN.