

B. F. STEWART.
Automatic Car-Brake.

No. 217,649.

Patented July 15, 1879.

FIG. 1.

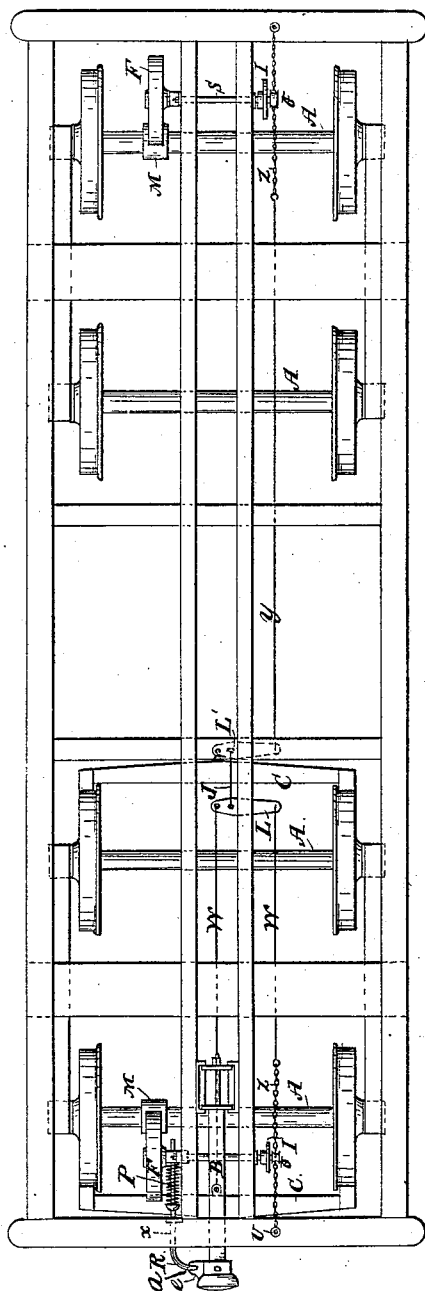
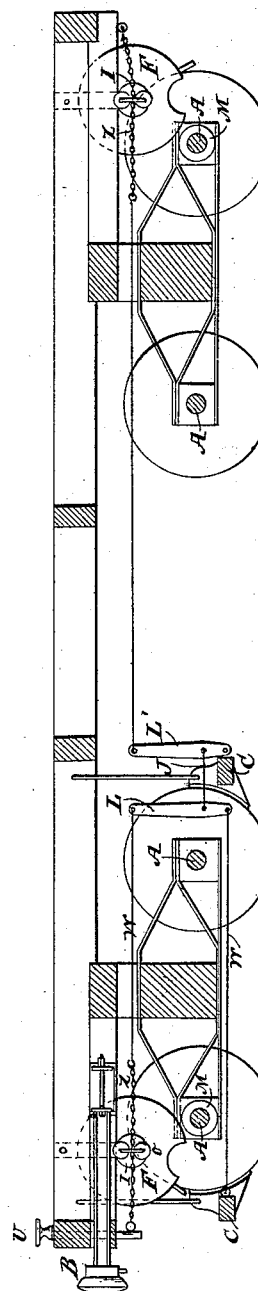


FIG. 2.



WITNESSES

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FIG. 3.

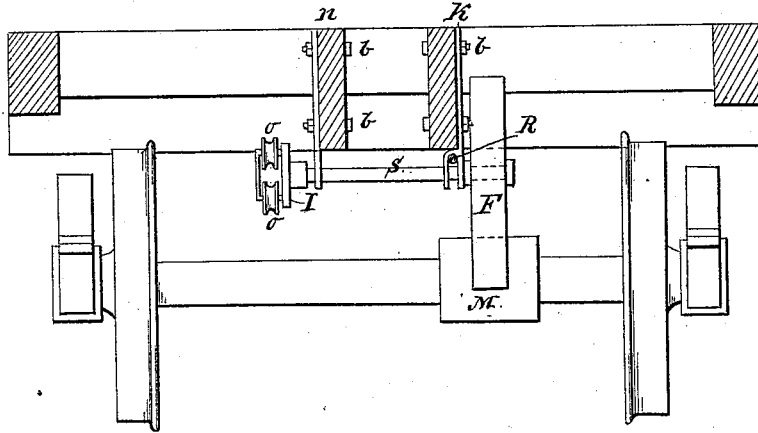


FIG. 4.

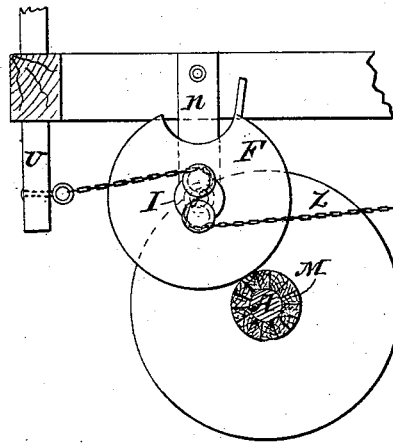
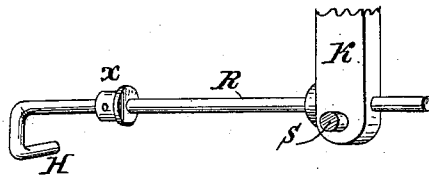


FIG. 5.



WITNESSES

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UNITED STATES PATENT OFFICE.

BENJAMIN F. STEWART, OF NEW PHILADELPHIA, OHIO, ASSIGNOR OF ONE-HALF HIS RIGHT TO D. A. HOPKINS, OF WASHINGTON, N. J.

IMPROVEMENT IN AUTOMATIC CAR-BRAKES.

Specification forming part of Letters Patent No. **217,649**, dated July 15, 1879; application filed October 7, 1878.

To all whom it may concern:

Be it known that I, BENJAMIN F. STEWART, of New Philadelphia, in the county of Tuscarawas and State of Ohio, have invented certain new and useful Improvements in Automatic Car-Brakes; and I do hereby declare that the following is a full, clear, and exact description of the invention, which 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 of reference marked thereon, which form a part of this specification.

This invention has for its object to utilize the momentum of a moving train of cars in automatically operating and setting the brakes, and is of the class described in Letters Patent of the United States No. 185,461, granted to me, and bearing date December 19, 1876.

The nature and operation of my said invention are fully set forth and explained in the following specification, the accompanying drawings making a part thereof.

Figure 1 is a plan view of a car of ordinary construction, including the trucks thereof, and having my said invention applied thereto, as in cases where but one truck of the car is supplied with brakes. Fig. 2 is a longitudinal section of the same. Fig. 3 is a cross-sectional view, showing attachment of hangers *k* and *n* to the car-frame, by which shaft *S*, carrying the disks *F* and *I*, is supported; also showing the actuating rod or bar *R*, hereinafter described, where it passes through a projection on the side of hanger *k*. Fig. 4 is a detail view, showing the position of small pulleys *o o*, hereinafter referred to, and of the brake-chain *Z* when the brake is set or applied to the wheels of the car. Fig. 5 is a view of the actuating bar or rod *R*, provided with hook *H*, for purposes hereinafter set forth.

The car framing and trucks are constructed in any usual proper manner, and provided with the usual sliding draw-bar *B*, axles *A*, brake-beams *C*, equalizing-levers *L* and *L'*, brake-rods *W* and *Y*, brake-chains *Z*, and brake-staff *U*, which are here only shown and referred to for the purpose of enabling me the more fully and clearly to set forth my said invention and its operation.

The sleeve *M* on one axle, *A*, and friction-disk *F* on an auxiliary shaft, *S*, are essentially the same as those shown and described in Letters Patent above referred to.

I provide the outer portion of the draw-bar *B* with a projecting perforated lug, *a*, as shown in Fig. 1, for the purposes hereinafter specified.

R is the actuating rod or bar, having its outer end bent to form an angle or hook, *H*, to be dropped into the eye of the projection *a* of the draw-bar. Extending backward said rod passes through the lower part of the hanger *k*, by which it is supported.

P is a coiled actuating-spring on the rod *R*, one end of said spring abutting against a stop or sleeve, *x*, on said rod, while the other bears against the hanger *k*.

The part of rod *R* back of the stop *x* passes freely backward and forward through the spring *P* and hanger *k*. The friction-disk *F* is firmly secured upon the shaft *S*.

I is a disk or head, of iron or other suitable material, rigidly secured to the shaft *S*, and serves to carry two small grooved pulleys, *o o*, as clearly shown in Fig. 3.

The pulleys *o o* are placed far enough apart to admit of the brake-chain *Z* passing freely between them, the chain being held in the grooves of said pulleys, which prevents its escape laterally from between the pulleys.

The equalizing-levers *L* and *L'* are both located at the inner end of the truck, as shown, for the purpose of obtaining the necessary room for the remaining parts of my improved brake mechanism.

The shaft *S* passes through the hangers *k* and *n*, at or near their lower ends, and is supported and carried by them. The hanger *k* is left free to swing, when required, by being secured to the framing of the car with only one bolt, *b*, which passes through it at or near its upper end and into said frame. The location of said hanger is such that when it assumes a perpendicular position, which it is sure to take when the car is at rest, the friction-disk *F* will be out of contact with the sleeve *M*.

The hanger *n* is secured to the car-frame by two bolts, *b b*, by which it is held rigidly in position, which is essential to the proper oper-

ating of the brake. In case of a spring-buffer separate from the draw-bar being used, the perforated lug *a* and the actuating-rod *R* may be attached thereto instead of to the draw-bar; and in cases where the inward and outward movement of the buffer or draw-bar are not sufficient to insure the requisite amount of movement of said actuating-rod and spring, the perforated lug *a* may be attached to the end of the next car immediately adjoining the one on which the operating of the brake is to be effected, in which case the actuating-rod is extended and attached to the perforated lug of the next car, and the hook *H* and the perforated lug so located as to be readily accessible, in order that the actuating-rod may be at once hooked to or unhooked from said perforated lug when desired.

The use of pulleys *o o* and head *I* renders practicable the use of the brake-chain *Z* in the automatic setting of the brake, without in any way interfering with the use of the hand-brake when the brakes are not automatically set. Said pulleys and head may be dispensed with by the use of a chain attached to shaft *S* and connected with the brake-rod *W*.

A recessed friction-disk, *F*, is, for most purposes, preferable to one not having a recess in and a stop upon its periphery; but one without said recess or stop may be used, provided that in case of backing or pushing a train of cars the actuating-rods *R*, at both ends of each car, are unhooked.

The perforated lug *a* may be dispensed with by substituting therefor, when desirable, any other equally convenient and reliable means of fastening the actuating-rod.

The spiral spring *P* is used by me because of its compactness, cheapness, and convenience, but is not absolutely necessary to the successful operation of the brake as herein contemplated, and any other practicable and convenient spring or weight for the purpose may be used, in combination with the actuating-rod *R* and vibrating-shaft *S*.

When preferable, the rod *R* may be carried by a small bearing, supported by shaft *S*, instead of passing through the hanger *k*.

The location of the equalizing-levers *L* and *L'* is not claimed by me as new, but is employed by me because of the advantage thereby secured in the locating and operating of machinery hereinbefore described.

When both trucks of a car are supplied with brakes, each may be equipped with my invention, the same as the one herewith shown, and they may be connected in the usual manner.

When cars in a train are to be pushed, as in the case of a pushing-engine to help a train in ascending a grade, each car pushed must have the actuating-rod at its front end unhooked, to prevent the automatic setting of the brake while the car is being pushed.

When a train is to be backed, the actuating-rod at the rear, or that end of each car which is farthest from the locomotive, must be unhooked, while the actuating-rod at the front, or

that end of each car which is nearest the locomotive, remains hooked, whether the train is being backed or pulled, in order that the automatic action of the brake may be always and instantly available for the stopping of the forward movement of the train when desired.

The locomotive when reversed, working against the momentum or forward movement of the train, or the application of brakes to the locomotive-tender or forward cars of a train, will cause the brakes upon the remainder of the cars to be automatically applied, as the draw-bars of buffers are, by the light collision of the cars, pushed inward and driven back, which causes them to force back the actuating-rods *R* to compress the springs *P*, swing back the hangers *k* and shafts *S*, and crowd the friction-disks *F* against the sleeves *M*, which, revolving with the axles *A* in a forward direction, turn said disks and shafts, and also the heads *I*, with their pulleys *o o*, which, winding or taking up the brake-chains *Z*, as shown in detail drawings, Fig. 4, apply the brakes.

The brake is instantly and with unfailing certainty released as soon as the force used in effecting its application is removed, either by the entire stoppage of the train or by the locomotive again acting in a forward direction.

By means of the spring *P* a yielding, adjustable, and yet constant pressure of the friction-disk *F* upon the sleeve *M* is obtained whenever the brake is being automatically applied, as set forth.

It will be observed that the construction and combination of actuating-rod *R* and actuating-spring *P*, with other parts of my said invention, are such that said rod and spring may be easily and quickly removed from the car, and again replaced, when desired.

This feature of my said invention is important, because of its enabling a railway company equipping its cars with said automatic brake to secure the full benefit without necessarily giving the use thereof to other connecting railways over which cars so equipped are permitted to run. The removal of either said spring or rod prevents entirely the automatic operation of the brake without in any way affecting the hand-brake.

It will be evident that the automatic brake is not applied unless the draw-head or buffer is pushed back. The disk *F* is out of contact with sleeve *M* when the car is being drawn forward, and also when it is at rest.

Having thus fully described my invention and its operation, I claim and desire to secure by Letters Patent—

1. The actuating-rod *R*, in combination with perforated lug *a* on draw-bar *B*, and with vibrating shaft *S* and pivoted hanger *k*, substantially as herein shown and described.

2. The spring *P*, in combination with rod *R*, hanger *k*, shaft *S*, and friction-disk *F*, essentially as set forth.

3. The pulleys *o o*, secured to the head *I* on the friction-shaft *S*, by which a shortening or

taking-up of the chain Z, which passes between said pulleys, is effected and the brakes applied, as set forth.

4. The combined relative location and arrangement of the rod R, spring P, hangers *k* and *n*, shaft S, disk F, pulleys *o o*, chain Z, and levers L and L', essentially as herein shown and described.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

BENJAMIN F. STEWART.

Witnesses:

DAVID A. HOPKINS,
T. B. MOSHER.