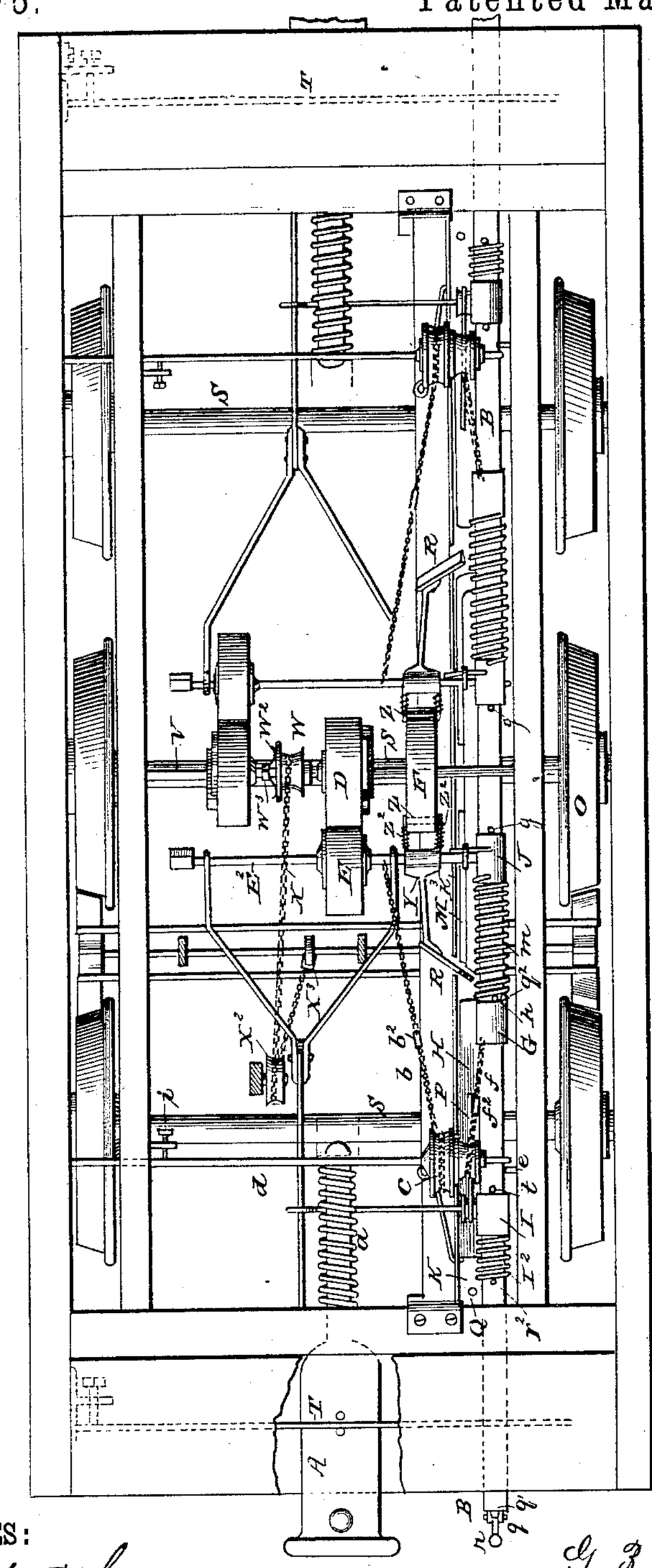
(No Model.) 3 Sheets—Sheet 1.

G. B. McLAUGHLIN.

AUTOMATIC CAR BRAKE.

No. 318,775. Patented May 26, 1885.

Fig. 1.



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(No Model.) 3 Sheets—Sheet 2.

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Fig. 2.

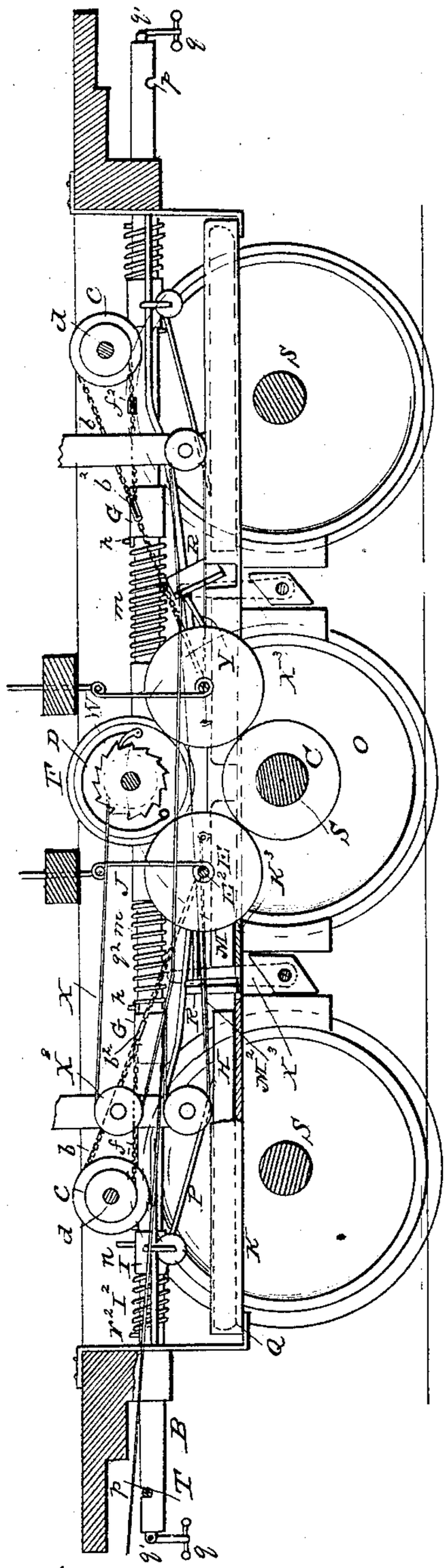
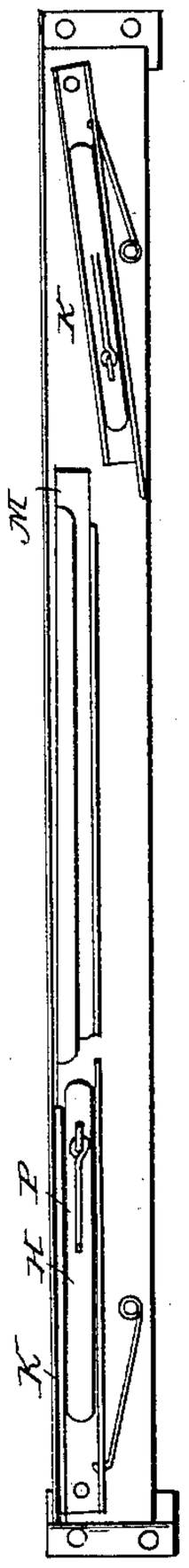


Fig. 4.



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(No Model.) 3 Sheets—Sheet 3.

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Fig. 3.

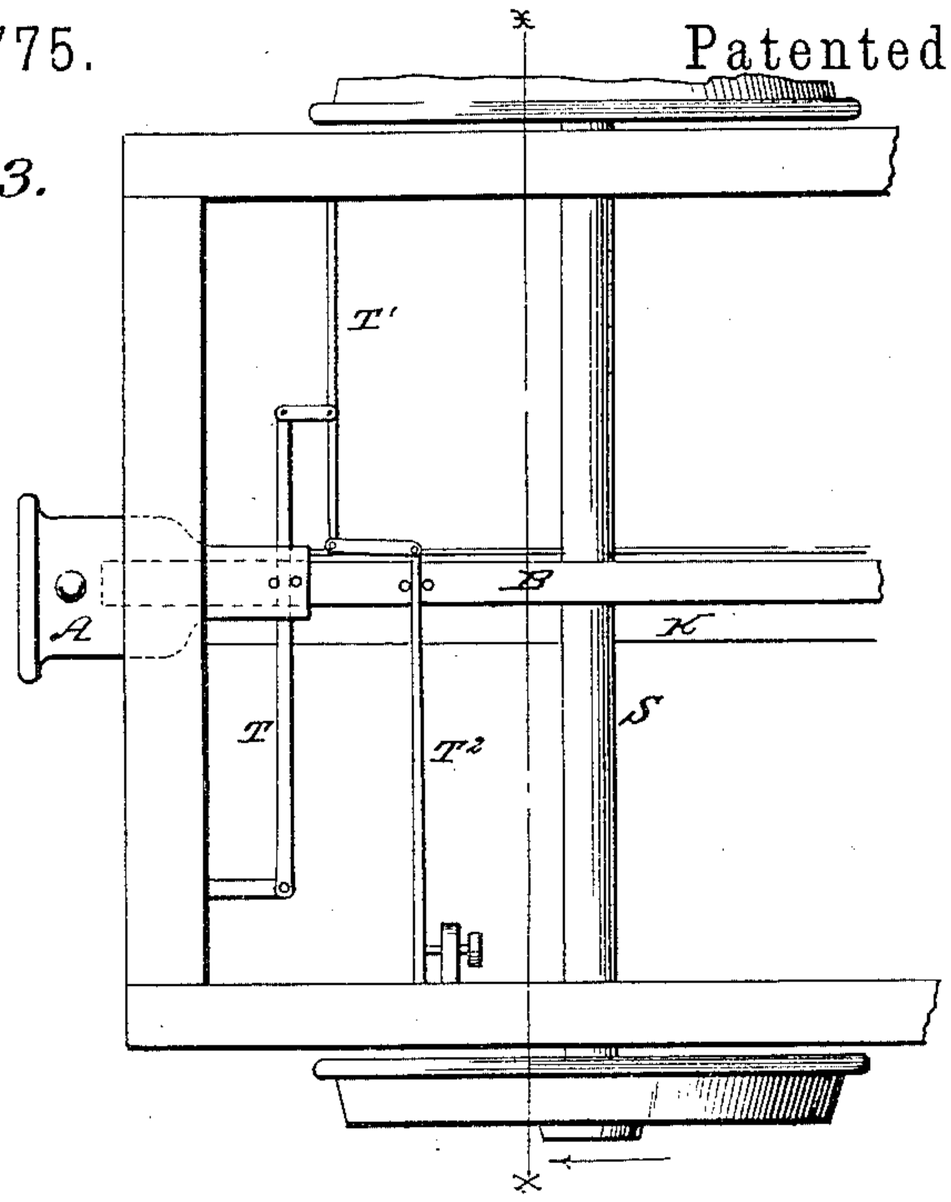


Fig. 5

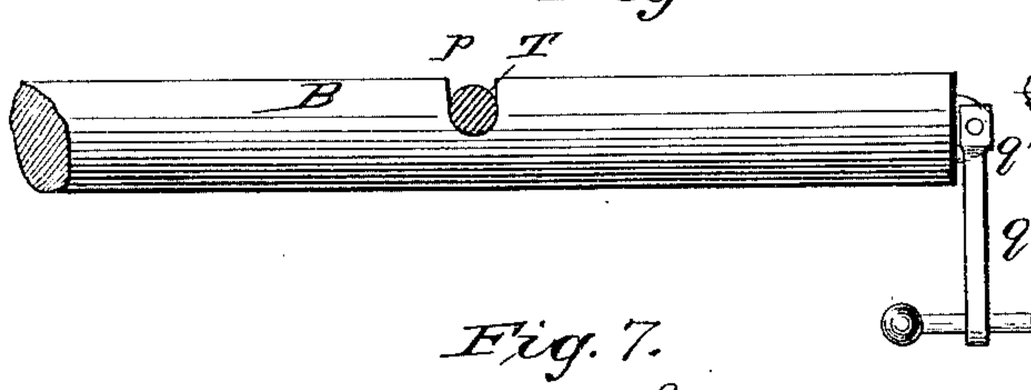


Fig. 6.

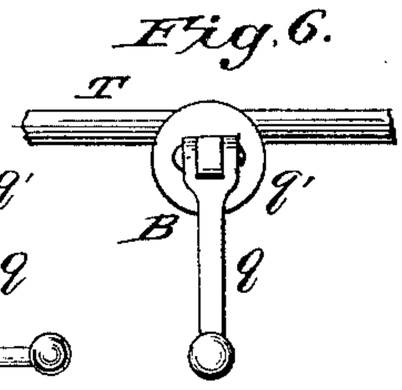
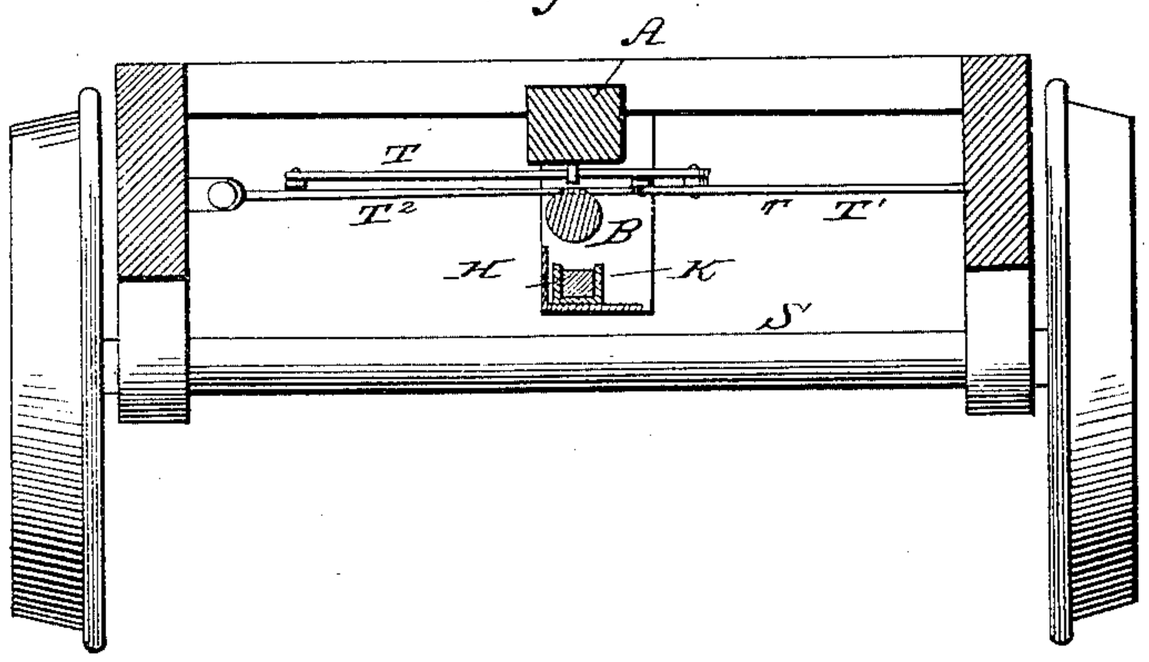


Fig. 7.



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UNITED STATES PATENT OFFICE.

GARRETT BLUE McLAUGHLIN, OF PETERSBURG, WEST VIRGINIA.

AUTOMATIC CAR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 318,775, dated May 26, 1885.

Application filed April 18, 1885. (No model.)

To all whom it may concern:

Be it known that I, GARRETT BLUE McLAUGHLIN, a citizen of the United States, residing at Petersburg, in the county of Grant and State of West Virginia, have invented certain new and useful Improvements in Automatic Car-Brakes, of which the following is a description.

The object of this invention is to provide means whereby the brakes commonly used upon cars may be set, through the medium of the draw-heads or bumpers, by one bumper crowding against another ahead of it when moving forward, and may be set while moving backward by the same draw-heads pulling upon each other. When moving forward the brakes are released when the draw-heads cease to crowd, and in moving backward the brakes are released when the draw-heads cease to pull. The object is, further, to provide means whereby the brakes shall be automatically set to stop cars which have become detached from the rear end of a moving train, whether the detached portion be following the train or receding therefrom down a grade. Each car is to carry the whole device complete in itself, and the device is arranged to operate in connection with the common hand-brakes without interfering in any way with the usual functions and operation thereof.

To this end the invention consists in the construction and combination of parts forming an automatic car-brake, hereinafter described and claimed, reference being had to the accompanying drawings, in which—

Figure 1 is a plan view of a portion of a car, showing a part of my invention. Fig. 2 is a longitudinal vertical section thereof. Fig. 3 is a plan view of a modification of the same. Fig. 4 is a detail in plan view. Fig. 5 is a side elevation of a portion of the communicator, and Fig. 6 is an end view of the same. Fig. 7 is a transverse vertical section of the modification shown in Fig. 3 at *x x*.

The apparatus is duplicated on the two ends of each car, and the description will be generally given of the device as applied at one end. The car being drawn one way will affect one braking device just the same as the other device will be affected when the car is drawn the other way.

A represents a draw-bar provided with a recoil-spring, *a*, as usual.

B is the communicator, consisting of a rod extending the length of the car, adapted to slide endwise and to revolve in its bearings, and provided at each end with a crank, *q*, pivoted thereto at *q'*, to swing in the plane of the axis of the rod, so that it may be inverted to hang down either way; and the wrist-pin or handle *v* extends through the bar of the crank, and is provided with a ball at each end, so that the crank may be used either side out to revolve the rod.

T T are spring-levers, secured at one end of each to the car, loosely engaged midway by the draw-bars to be swung to and fro by the moving out and in of the draw-bars, and each is adapted to engage a notch, *p*, in the communicator B when the notch is turned upward. One notch *p* is on the upper side of the communicator when the other notch *p* at the other end of the communicator is on the under side thereof, so that motion cannot be given to the communicator by both draw-bars at the same time. The levers T are springs, to avoid communicating sudden shocks to the brake-works.

S represents the axles, and O the wheels, of which three pairs are shown in Fig. 1 in a single truck like those on which coal-cars are mounted.

C is a wheel fixed on one of the axles S, and D is a similar wheel, mounted on a shaft, V, and connected therewith by a spring pawl and ratchet directly over the wheel C. The axle V is journaled in a fixed portion of the truck.

E is a friction-wheel, loosely mounted on a shaft, E^2, one end of which is secured to a sleeve, J, which is mounted on the communicator B to move with the longitudinal motion thereof, whereby the wheel E is pressed into contact with the two wheels C and D, to communicate the motion of the drive-wheels to the wheel D.

W is a drum mounted on the axle V to revolve therewith to wind up a chain, X, which passes over a pulley, X^2, and is attached to the brake-lever X^3. Thus when the draw-head is pressed forcibly back it acts on the lever T and presses the communicator B back, carrying the sleeve J and the shaft E^2, bring-

ing the wheel E in contact with the wheels C and D, thereby revolving the drum W, winding up the chain X, and applying the brake. When the engine starts ahead, the bumpers will be drawn apart, and the brake will be released. The drum W is mounted to revolve on the shaft V, and is secured thereon by means of a friction-spring, W^2, bearing against a screw-collar, W^3, so that when the brake has been applied with the maximum degree of force required any further revolving of the shaft V will slip within the drum. The screw-collar allows the force of this friction-spring to be adjusted. Otherwise something would be broken when the train is under headway and the brakes are suddenly applied.

I is another sleeve, similar to sleeve J, and mounted upon the rod B between a spring, I^2, and a fixed pin, *t*. Another pin, *r*, fixed in the rod, acts against the spring which transmits the motion to the sleeve I.

m is a spiral spring upon the rod B, actuated by the pin *h*, fixed in the rod to move the sleeve J and prevent sudden shocks thereon. This spring acts also as a screw. When the rod B is revolved in one direction, the pin *h* will retreat into the spiral of the spring, thus relieving its tension and drawing forward the sleeve J and wheel E, so that the automatically-acting device is thrown out of operation. When the rod B is revolved in the other direction, the pin *h* will advance out of the spring until the spring is returned to its working position. This may be known by the pin *h* striking a stop, q^2, lug, or pin, which is fixed on a sleeve, G, which is mounted on the rod B and attached to the spring *m* to move therewith.

d is a spring-bar, secured at one end to the truck-frame, and *i* is a set-screw by which the tension of the spring may be regulated.

e is a stop pin or shoulder on the frame, to limit the ontward motion of the spring.

c is a double drum, mounted to revolve on the spring *d* as an axle. The smaller end of the drum is connected by a chain, *f*, with the sleeve G, and the larger end is connected by a chain, *b*, with the axle E′ of the friction-wheel E, the two chains winding in opposite directions upon the drums, so that a pull upon the chain *f* unwinds it and winds up the chain *b* at a faster rate. The two chains are provided with swivel-screws b^2 and f^2, respectively, by which they may be adjusted to a proper relative tension.

H is a push-bar, fitted to slide longitudinally in a trough, K, coming in contact at one end with another push-bar, M, and at the other end connected by a hinged brace, P, with the sleeve I. The bar M is connected with the brakes by a chain, M^2. The trough K^3, in which the bar M slides, is permanently fixed on a platform, N, but the trough K is pivoted to said platform at Q so that its opposite end will swing laterally.

F is a wheel rigidly secured on the shaft V.

Y is a switch loosely mounted on the shaft E^2, to swing vertically, and provided with an inclined blade, R, adapted to pass down between the sections K and K^3 of the trough, whereby the push-bar H is deflected from its line, the trough K being swung laterally by the said deflection. The bar H passing beside the bar M, and not then connecting therewith, no effect is produced on the brakes by its sliding motion.

Z is a friction-roller mounted on the short arm of the switch, to impinge against the wheel F whenever the wheel E is pushed into contact with the wheels C and D. If this contact takes place when the car is moving forward, the action of wheel F will hold the switch raised, so that the push-bars H and M may assist in applying the brakes; but if the car be moving backward the action of the roller F, being in the opposite direction, will force the switch into the trough and throw the push-bars H and M out of operation, so that the act of backing the train does not apply the brake, the path of the push-bar H not permitting that to actuate the bar M. The roller Z is mounted in a fork of the short arm of the switch, and is provided with springs Z^2, to ease its contact with the wheel F. The blade end *r* of the switch, being the heaviest, falls into the trough by gravity when not suspended by contact of the roller Z with wheel F. When the cars are being pulled by the draw-bar A, the wheel E is pulled away from contact with wheels C and D by the action of pin *g* upon sleeve J, and the switch is free to drop to place in the trough; but in consequence of a strong pull at a heavy load the wheel E′, belonging to the braking apparatus of the other end of the car, would come into contact with wheels C′ D′. That, however, would not set the brakes, or affect the drum W or the push-bar M′, because, first, the wheel D′ is loose on the axle, and it is not revolved in the right direction to engage the pawl and ratchet; second, the incline R′ would be at rest in the trough, and would prevent any action on the part of the push-bars H′ and M′. Furthermore, if the roller Z′ were to come in contact with wheel F the direction of revolution thereof would hold the incline R′ tighter down in the trough, and prevent the action of the brakes.

In making up trains in the yard and at some other times, it may be desirable to have the automatic operation of the brake temporarily interrupted. The two springs *m* and *m′* are wound in directions opposite to each other, so that by revolving the rod B one way and leaving the notches disengaged the springs will be drawn apart, and the brakes will be thereby thrown out of service, and by revolving it the other way and leaving one of the notches engaged the springs will approach each other and return the parts to position for service. The rod B, to produce the proper effect, should be set that side up which communicates with the lever T at the forward end of the car next to the engine. One

reason for this is that, whether being drawn or pushed, the two draw-bars of any car within a train will be moved in opposite directions to each other by the same impulse. If being drawn, both draw-bars will be drawn outward—that is, away from each other. If being pushed, they will approach each other. When the rod B is free from any force from either draw-head, the wheels E and E′ are respectively in contact with the wheels C D and C′ D′. Hence if from any cause other than a push or pull on the draw-bar the car should be moved—as, for example, let go on a down grade—the motion of the wheel O would cause the wheels C E D to revolve, the drum W would wind up the chain X, and set the brake before the car had gone many feet. By providing this part of the device alone, and excluding that portion combined with the trough K, cars would be automatically stopped whenever broken off or detached from a train.

The foregoing description relates to coal-cars having six-wheeled trucks. On cars using two complete and separate trucks it is necessary that the rod B should be made to some extent flexible, which may be done by making any style of universal joints thereon, that it may accommodate itself to the respective motions of the two trucks. It is also necessary that the rod B and push-bars H and M should be located in a vertical plane beneath the draw-heads. To this end the lever T may be repeated, as shown at T′ and T″, Fig. 3. This lever T communicates motion from the draw-bar A to lever T′, which acts upon lever T², and that is connected with the communicator B, as before described, the tension-screw *i* acting indirectly on the lever T. Suppose the car to be moving in the direction of the arrow, Fig. 2. Now, if pressure be brought against the draw-bar A the rod B will be forced back, carrying with it the push-bars P, H, and M, setting the brakes, and the force with which they are applied is in proportion to the momentum. On all ordinary occasions this would be sufficient; but on a steep grade, or when it may be necessary to bring a train to a stop as quickly as possible on account of danger, &c., the engine, being reversed or otherwise rapidly checked, will bring the wheel E and drum X to the assistance of the push-bars, and the brakes will be applied with the greatest possible force.

When the above-described parts are all properly adjusted, and the rod B is pushed backward a little, the wheel E will at first be withdrawn from contact with wheels C and D, because the spring *d* is stronger than the spring *m*, and remains as a stationary axis, upon which the pulley *c* turns by the action of spring *m* and chain *b*, winding up the chain *f* and drawing wheel E out of contact, as stated; but a stronger push on the rod B will bring a lug or pin, *n*, on the sleeve I in contact with the spring *d*, and force it in the direction of the wheel E, and as the spring *d* moves, the spring *m* reacts and forces the wheel into action with the wheels C and D, whereby the whole force of the brakes will be applied. When cars are running together in a train, their draw-bars crowd together whenever the speed of a rear car is greater than that of the preceding one. Whenever this happens to a car provided with my invention, it feels the influence of the brakes, and the speed is evened. With this improvement the speed of the cars is not only equalized, but on a descending grade the weight or momentum of the rear cars does not accumulate and crowd to any extent upon the engine or those in the forward end of the train, and hence the engine is not forced to travel any faster than the engineer intends it shall move.

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

1. The combination of the draw-bar A, fitted to slide lengthwise in a car, the lever T, secured at one end to the car and connected midway with the draw-bar, the sliding rod B, notched to receive the lever T, and connections from the said rod B to the brakes, substantially as shown and described, whereby sliding motion of the draw-bar may actuate the brakes, as set forth.

2. The combination of the draw-bar A, fitted to slide in a car, the lever T, secured at one end to the car and connected midway with the draw-bar, the rod B, notched to receive the lever T, and the crank *q*, reversibly hung to the said rod B, as shown and described, whereby the rod is weighted to hold its notch up or down, as specified.

3. The combination of the draw-bar A, the lever T, engaging the draw-bar, the rod B, fitted to slide lengthwise, and to revolve in bearings, and notched in its side to receive the lever T, and the crank *q*, reversibly hung to the rod B, and provided with a wrist-pin extending at two sides of the crank bar or arm longitudinally with the car, substantially as shown and described.

4. The combination of the draw-bar A, the lever T, engaging the draw-bar at one end of a car, the rod B, extending from end to end of the car, and provided with a notch on one side at one end to receive the lever T, and with a similar notch on the opposite side at the opposite end, and another similar draw-bar and lever at the said opposite end of the car, the lever adapted to engage the notch or to be disengaged therefrom, substantially as shown and described, whereby the braking device is adapted to act in unison alternately on the two ends of a car without interference, as set forth.

5. The combination of the wheels O and axles S, the wheel C, fixed on an axle S, the wheel D, mounted on a shaft, V, and connected therewith by means of a pawl and ratchet, the friction-wheel E, loosely mounted on a shaft, E², the communicator-rod B, connected to slide with the draw-bar, a sleeve, J, mounted on the rod B, the shaft E², fixed to

the said sleeve, and a drum, W, on the shaft V, connected by a chain, X, with the car-brake, substantially as shown and described.

6. The combination of the shaft V, the drum W, loosely mounted thereon, the collar W^3, screw-threaded thereon, the spring W^2, between the said collar and drum, a chain connecting the drum with a car-brake, and an automatic device, substantially as described, connecting the shaft V with the car-wheels, as specified.

7. The combination of the rod B, connected to slide endwise with the draw-bar of a car, the sleeve J, loosely mounted on the rod B, the spiral spring *m*, around the said rod, connected with the sleeve J, the pin *h*, fixed in the rod to engage the spring, and a crank, *q*, attached to the end of the rod, substantially as shown and described.

8. The combination of the rod B, connected with the draw-bar of a car, the sleeve J, loosely mounted on the rod, the spring *m*, around the said rod and connected with the said sleeve, another sleeve, G, on the rod attached to the spring at the opposite end to the sleeve J, a pin, *h*, in the rod engaging the spring, and a lug or stop-pin, *q'*, in the sleeve G in the path of pin *h*, substantially as shown and described.

9. The combination of the slide-rod B, the sleeves J and G, and the spring *m*, connecting them, the spring-axle *d*, secured at one end to the car, the double drum *c*, mounted on the other end of the said spring, the friction-wheel E, the shaft E^2 therefor, fixed to sleeve J, the chain *f*, connecting the drum with the sleeve G, and the chain *b*, connecting the drum with the shaft E^2.

10. The combination of the slide-rod B, the sleeves J and G, and spring *m* thereon, the spring-axle *d*, secured at one end to the car, the double drum *c*, mounted on the other end of the said spring, the friction-wheel E, the shaft E^2 therefor, fixed to sleeve J, the chains *f* and *b*, connecting the drum *c* with the sleeve G and shaft E^2, respectively, and the stop lug or pin *e*, secured in the frame in the path of the axle *d*, substantially as shown and described.

11. The combination of the slide-rod B, the sleeve I thereon, the trough K, secured to the car, the push-bars H and M in the trough, the chain M^2, connecting the bar M with the car-brake, and the brace P, hinged at one end to the sleeve I, and at the other end to the bar H, substantially as shown and described.

12. The combination of the platform N, secured to the car, the trough K, pivoted at the end Q to the platform, the trough K^3, secured to the platform in line with trough K, the push-bars H and M, fitted to slide in the said troughs, the chain M^2, connecting the bar M with the car-brake, the slide-bar B, the sleeve J thereon, the axle E^2, secured to sleeve J, the wheel F, connected with the running-gear of the car, and the switch Y, loosely mounted on the shaft E^2, provided with an inclined blade, R, adapted to swing between the sections K and K^3 of the trough, and provided with a friction-roller Z, adapted to engage the wheel F, substantially as shown and described.

13. The combination of the sections of trough K and K^3, the wheel F, the switch Y, provided with the inclined blade R at one end, the roller Z at the other end, and the springs Z^2, the switch pivoted to swing with the roller Z tangent to the wheel F, as shown and described.

14. The combination of the sectional push-bar H M, the sectional trough K K^3, the trough K pivoted at Q, and the switch Y, provided with the inclined blade R, adapted to swing between the sections of trough K and K^3, substantially as shown and described, for the purpose specified.

GARRETT BLUE McLAUGHLIN.

Witnesses:

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