(No Model.) 2 Sheets—Sheet 1.

G. SHONE.

AUTOMATIC CAR BRAKE.

No. 343,204. Patented June 8, 1886.

Fig. 1.

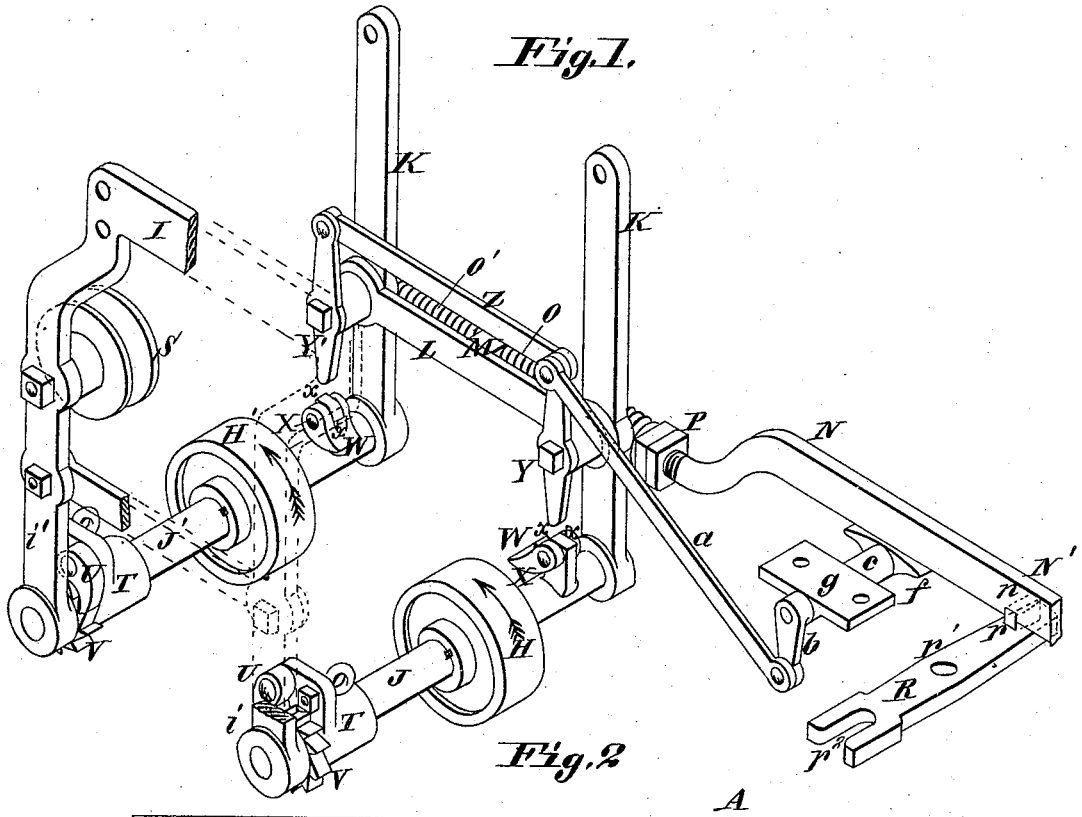

Fig. 2.

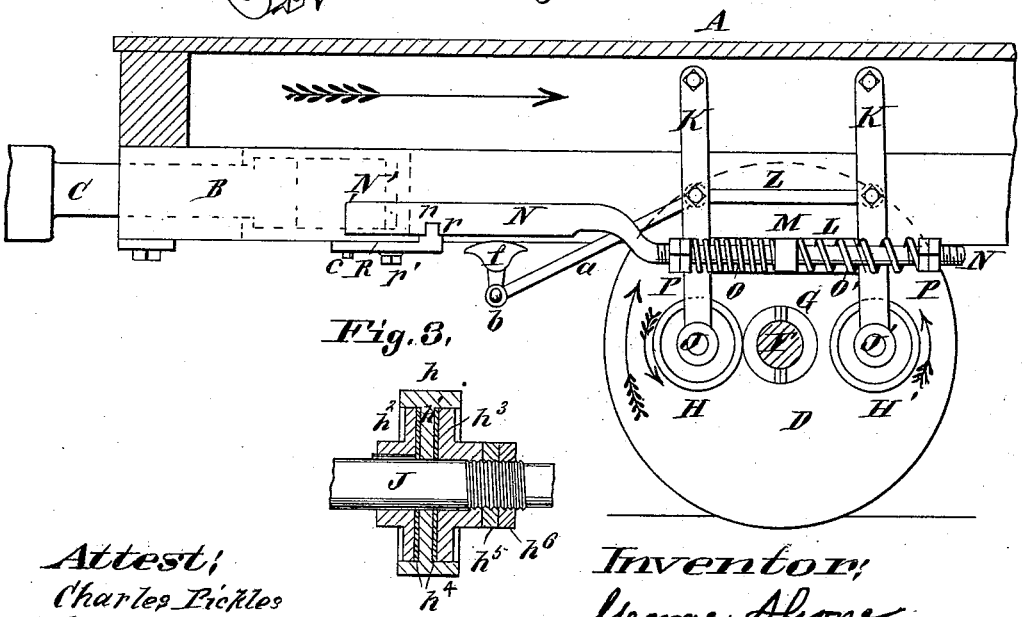

Fig. 3.

Attest:
Charles Pickles
F. A. Hopkins

Inventor:
George Shone
By Knight Bros.
Attys.

(No Model.)

2 Sheets—Sheet 2.

G. SHONE.

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Fig. 4.

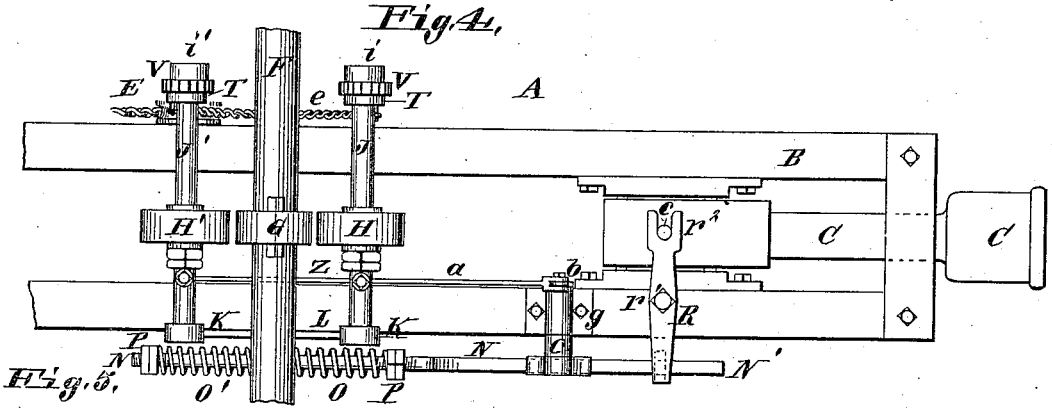


Fig. 5.

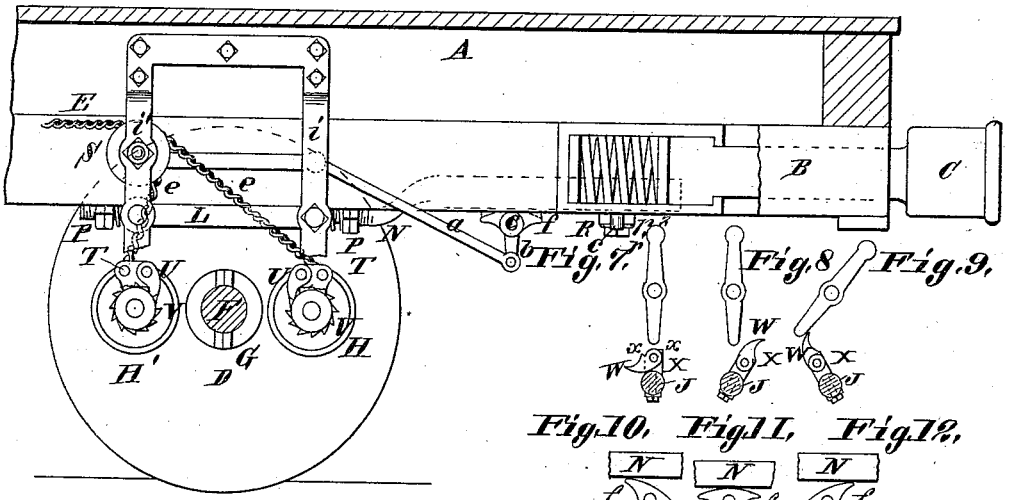


Fig. 7.

Fig. 8

Fig. 9.

Fig. 10.

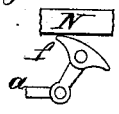


Fig. 11.

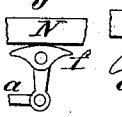


Fig. 12.

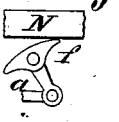
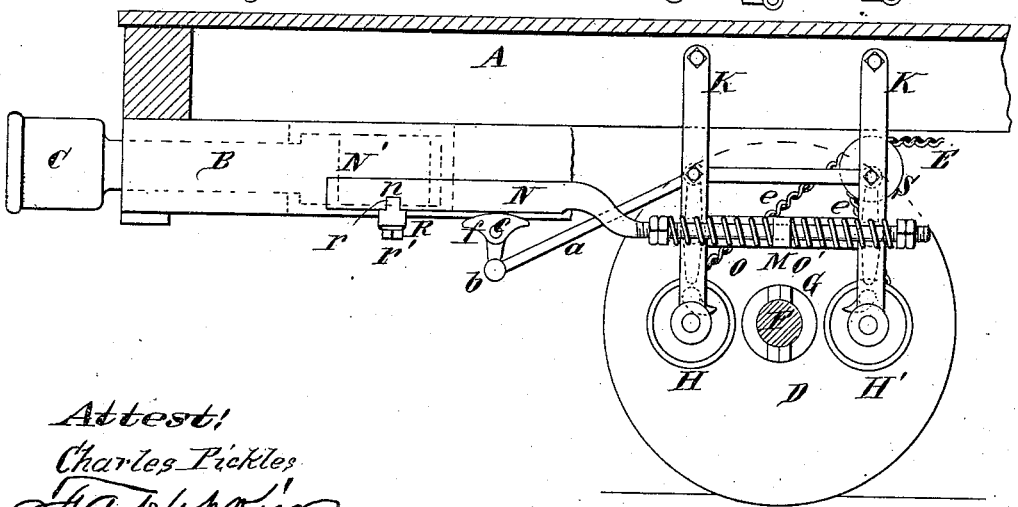


Fig. 6.



Attest:
Charles Pickles
F. A. Hopkins

Inventor:
George Shone
By Wright Bros
Attys.

UNITED STATES PATENT OFFICE.

GEORGE SHONE, OF EAST ST. LOUIS, ILLINOIS.

AUTOMATIC CAR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 343,204, dated June 8, 1886.

Application filed October 3, 1885. Serial No. 178,926. (No model.)

To all whom it may concern:

Be it known that I, GEORGE SHONE, of East St. Louis, St. Clair county, in the State of Illinois, have invented a certain new and useful Improvement in Duplex Automatic Car-Brakes, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

This brake belongs to that class in which the brakes are applied when the draw-bars are forced inward while the train is running forward or drawn outward while the train is backing.

The claims are referred to as specifying the novel features of the improvement.

Figure 1 is a perspective view showing the parts in normal or inert position. Fig. 2 is a longitudinal section showing the parts of the mechanism in side view with the draw-bar drawn outward while the train is backing and the brake mechanism in action. Fig. 3 is an axial section of one of the friction-wheels. Fig. 4 is a bottom detail view showing the position of the parts when the car is at rest. Fig. 5 is a longitudinal section at 5 5, Fig. 4, and Fig. 6 is a similar section at the other end of the car. Figs. 7, 8, and 9 show the various positions of the hinged cam and lever on which it acts. Figs. 10, 11, and 12 show the lifting-cam in its various positions.

A is part of a car-body, and B the draw-timbers. C is a draw-bar. All of these have the usual or any suitable construction, and no novelty is claimed therein, nor in the wheels D, nor the hand-brake mechanism, (not shown,) as it forms no part of my invention.

The brake-chain E leads to a common hand-brake lever.

F is the axle having upon it a friction wheel or collar, G, with which either of the two friction-wheels H H′ may be brought in contact to wind up the brake-chain E and set the brakes.

I is a rigid hanger bolted to the truck-timber and having two hanger-arms, *i i′*, in whose lower ends the shafts J J′ of the friction-wheels H H′ have journal-bearings at one end. The other ends of the shafts J J′ have journal-bearing in swing-hangers K, hinged at their upper ends to the car-timber. The swing-hangers are connected by a horizontal link, L, hinged to the hangers, so as to keep them parallel one with the other in their movements.

M is a lug upon the middle part of the link L, through which passes a bar, N, the bar working freely in the lug.

O O′ are spiral springs surrounding the bar N at each side of the lug, each spring bearing against the lug at one end, and at the other end against one of a pair of jam-nuts, P, screwed upon the bar. The bar N extends beside one of the car-timbers, and has in its under edge a notch, *n*, to engage a rib, *r*, upon the top of the lever R, at one end thereof. The lever R is fulcrumed at *r′* to the car-timber, and has a fork or slot, r^2, which receives a pin, *c*, at the bottom of the draw-bar. The arrangement is such that when the rib *r* is engaged in the notch *n* that the longitudinal movements of the draw-bar are imparted to the bar N, causing a reverse movement in the same.

On the longitudinal movement of the bar N one of the springs (O or O′) acts on the lug M, and the hangers K are moved backward or forward, as the case may be, which brings one of the friction-wheels H H′ against the friction-wheel G upon the axle. Thus it will be seen that on the movement of the draw-bar from its normal position in either direction one of the friction-wheels H H′ is brought in contact with the wheel G upon the axle.

The brake-chain E has two branches, *e*, which pass over a grooved pulley, S, and extend, respectively, to loose collars T upon the shafts J J′. The shafts turn freely within the collars in one direction; but when the shaft is turning in the other direction it carries the collar around with it by means of a dog or pawl, U, on the collar, which engages a ratchet-wheel, V, which is fast upon the shaft. At the opposite end of each shaft from the pawl U is a cam, W, connected to the shaft by a rule-joint, X, so that when the shaft is turning in one direction it will project from the shaft, as shown in Figs. 8 and 9, and the shoulders *x* of the rule-joint bearing together it will be held rigid as its convex face *x′* acts on the lever Y or Y′, whereas when the shaft is turning in the opposite direction the cam will fail to act on the lever, as contact with the lever would throw it into the position shown in Fig. 7.

The levers Y Y′ are fulcrumed to the swing

hangers or links J J′, and their upper ends are connected by a link-bar, Z, so that they move simultaneously. *a* is a rod hinged to the top of the lever Y and connecting it to the arm *b* of a rock-shaft, *c*, which carries a lifting-cam, *f*, upon which rests the bar N. The curved upper face of the cam is of such a radius that as the shaft *c* is turned either way in its bearing *g* the free end N′ of the bar N is thrown upward and the notch thus disengaged from the rib *r*, and when this is the case the bar N is not acted on by the draw-bar and the brake mechanism regains its normal position, in which neither of the friction-wheels H H′ are in contact with the friction-wheel G and the wheels are relieved from the brakes. If, however, the draw-bar is forced in while the train is moving forward or drawn out when the train is backing, the notch *n* is brought over the rib *r* and engages on it, and the wheel H or H′ is brought in contact with the friction-wheel G upon the axle, and the shaft J or J′ rotated and the brakes set by the winding of the chain E upon the shaft.

To relieve the brake mechanism from excessive strain, the rims of the wheels H H′ (or of wheel G) are made to turn when there is a sufficient degree of strain on the brake-chain E. For this purpose the rim *h* has a web or flange, *h′*, which is between two friction-collars, h^2 and h^3, forming the hub of the wheel. Between the web *h′* and the collars are interposed friction-disks h^4, of leather or other suitable substance. One of the collars, as h^2, is keyed or otherwise made fast to the shaft J, while the other collar, h^3, is made adjustable on the shaft, so that it can be moved to or from the fixed collar to adjust the amount of friction upon the web *h′*. The collar h^3 is forced toward the collar h^2 by a nut, h^5, screwing on the shaft and held in place by a jam-nut, h^6.

The operation of the brake is as follows: The brake is supposed to be in its normal position with the notch *n* of the bar N engaged on the rib *r* of lever R. Now, supposing the train to be drawn forward, the draw-bar will be drawn outward, the bar N be forced inward, and the wheel H brought in contact with the wheel G of the car-axle, and as soon as the car moves forward the axle J is turned in the direction shown by the arrow in Fig. 1. This, it will be seen, will throw up the cam W into the position shown in Fig. 8, and the lever Y will be thrown into the position shown in Fig. 9, which will cause the lifting-cam *f* to assume the position shown in Fig. 10, and the free end N′ of the bar N will be thrown up, disengaging the notch *n* from rib *r*, when the brake mechanism again assumes its normal position and the friction-wheels G H H′ are out of contact. While the shaft J is rotating in this direction the ratchet-wheel V will turn beneath the pawl U without engaging the same, and the collar T will remain at rest, so that the brake-chain will not be wound on the shaft.

It will be seen that while the train continues running and the draw-bar is stretched out, that the rib *r* will be farther from the end N′ of the bar N than the notch *n*. Now, supposing the draw-bar to be forced inward, (in the car,) the rib *r* would be carried to the notch *n*, and the latter would engage upon it, and as the draw-bar continued to move inward the wheel H′ would be brought in contact with the wheel G and the shaft J′ would be turned in the direction shown by the arrow upon wheel H′ in Fig. 1. It will be seen that when this shaft rotates in this direction the hinged cam W will not act on the lever Y′, and consequently the notch *n* will not be thrown out of engagement with the rib *r*, so that the friction-wheel H′ will continue in contact with the friction-wheel G as long as the draw-bar is forced inward. It will also be seen that when the shaft J′ rotates in the direction shown that the ratchet-wheel V will engage the pawl U, and the collar T will turn with the shaft, winding up the brake-chain E upon the shaft and setting the brakes to the wheels. When the proper strain has been exerted on the brake-chain, the rim *h* of the wheel H′ turns upon the collars h^2 h^3 and relieves the chain from extreme strain. When the train comes to rest and the draw-bar regains its normal position, (under the influence of the ordinary draw-bar, C′,) the friction-wheel H′ is carried out of contact with the wheel G and the chain *e* is unwound from the shaft J′ by the backward movement of the brake-bars from the wheels. Supposing the train to require to be backed after it has been brought to rest and before the draw-bars have acquired their normal position, it will be seen that the first movement of the wheels in turning backward would release the brakes. Now, suppose the cars to be at rest and the brake mechanism in normal position, and it is desired to back the train, the draw-bar will be forced inward and with bar N will be drawn outward, carrying the wheel H′ into contact with the wheel G, and as the wheel D turns backward the wheel H′ will rotate in the opposite direction to that indicated by the arrow in Fig. 1. This will bring the cam W to act on the lever Y′, and the free end of the bar N will be thrown up by the lifting-cam *f*, in assuming the position shown in Fig. 12, and in this way the notch *n* is disengaged from the rib *r* and the brake mechanism regains its normal position with both the wheels H H′ out of contact with wheel G. While the shaft J′ is turning in the said direction, the ratchet-wheel V runs beneath the pawl U without engaging it, so that the collar T is not turned and the brakes are not applied to the wheels. Now, supposing it is desired to apply the brakes while running backward, the brake is applied to the engine and the draw-bars stretched out, as shown in Fig. 2, which will carry the notch *n* into engagement with the rib *r* and force the bar N inward and carry the wheel H into contact with the wheel or collar G. (See Fig. 2.) Then the shaft will be turned in the direction shown, and the ratchet-wheel V will engage the pawl U, the collar

T will be turned, the brake-chain *e* wound upon the axle, and the brake applied.

I have shown the bar R with an open notch or fork, r^2, in which the pin *c* of the draw-bar has bearing. This is a feature of considerable practical importance, as it relieves the brake mechanism from strain or fracture in the event of the draw-bar being drawn from its bearings, as is not very uncommon. In such an event the pin *c* would simply escape from the notch r^2.

I claim—

1. The combination of a draw-bar, C, lever R, with rib *r*, bar N, with notch *n*, the hangers K K, connected to the bar N, substantially as set forth, shafts J J′, having bearings in the hangers K, and constructed to be turned by frictional contact with the car-axle, ratchet-wheel V, collar T, with pawl U, hinged cams W, and connection between the cams W and the bar N, to throw up the end thereof and disengage the notch *n* from the rib *r*, substantially as set forth.

2. The combination, with a car-axle, of two shafts on opposite sides of the axle, constructed to wind up the brake-chain by frictional contact with the axle, substantially as set forth, and having bearing on swing-hangers, substantially as and for the purpose described.

3. The two swing-hangers K K, supporting one end of each of the two winding-shafts J J′, and connected by a link, L, substantially as and for the purpose set forth.

4. The chain-winding shaft having a jointed cam, W, constructed to act when the shaft is rotating in one direction and to be inert when it is rotating in the opposite direction, in combination with a loose collar, T, upon the shaft having the brake-chain attached thereto, and a pawl thereon engaging a ratchet-wheel on the shaft when the shaft is rotating in the direction to cause the inertness of the cam W.

5. The winding-shafts J J′, having bearing at one end in fixed hangers *i i′* and at the other in swing-hangers K K, substantially as set forth.

6. The swing-hangers K K, connected by link-bar L with lug M, the bar N, passing through the lug, springs O O′, bearing against the side of the lug and against nuts P P on the bar, in combination with the lever R and draw-bar C, substantially as set forth.

7. A friction-wheel consisting of a web, *h′*, having a rim, *h*, a fixed collar, h^2, adjustable collar h^3, and friction-disks h^4, of leather or analogous material, the disks being located between the collars and web, and the rim being adapted to turn on the collars, substantially as set forth.

8. The combination of a draw-bar, C, lever R, bar N, springs O O′, lug M, link-bar L, swing-hangers K K, shafts J J′, the friction-wheel G, cams W, wheels H, H′, and V, and collar T, with pawl U, and fixed hangers *i i′*, substantially as and for the purpose set forth.

9. The combination of the two winding-shafts J J′ with reversed hinged cams W, the levers Y Y′, link Z, rod *a*, arm *b*, cam-shaft *c*, cam *f*, bar N, lever R, springs O O′, link-bar L, and swing-hangers K, substantially as set forth.

GEO. SHONE.

Witnesses:
SAML. KNIGHT,
BENJN. A. KNIGHT.