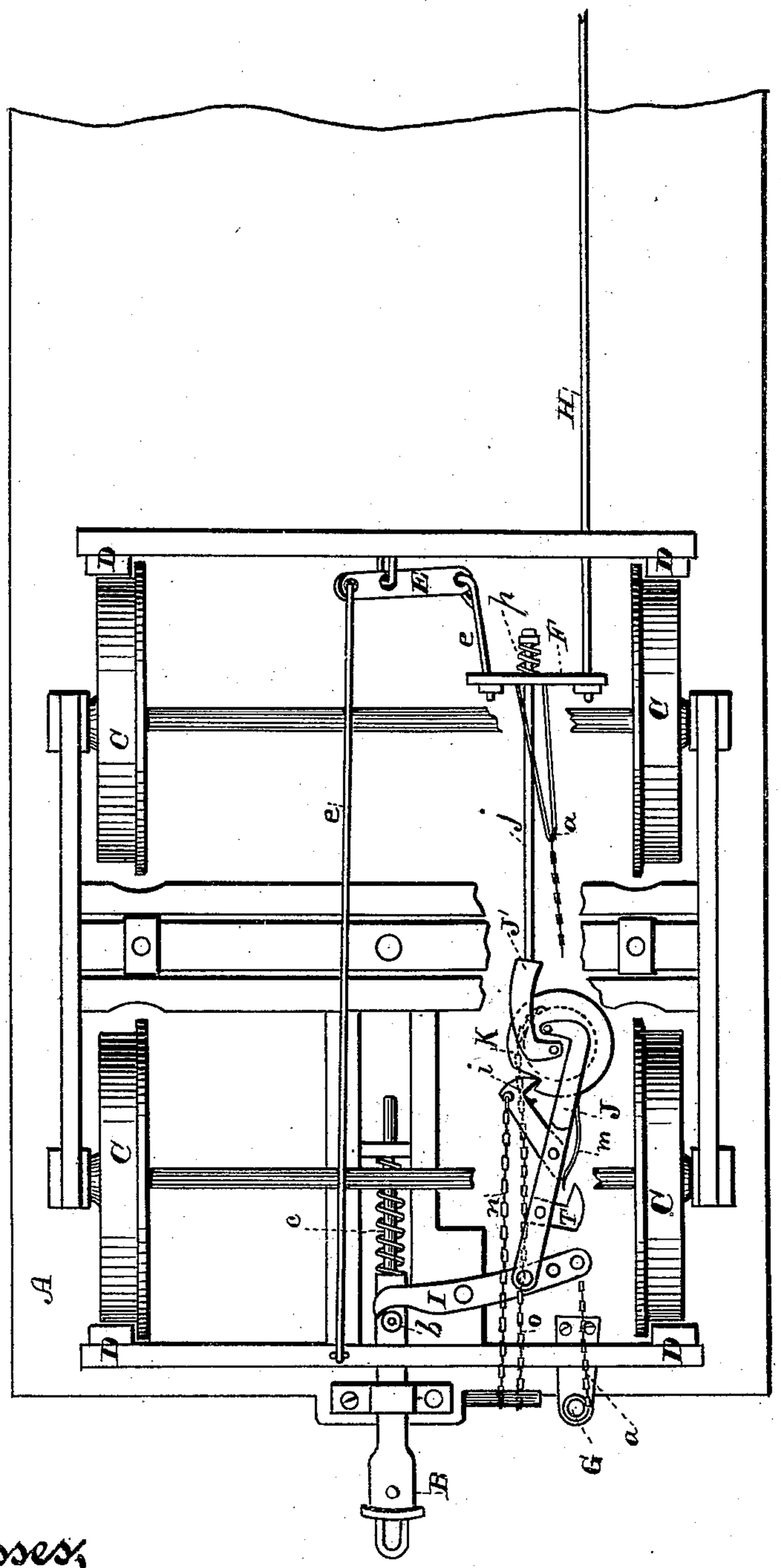
(No Model.) 2 Sheets—Sheet 1.

E. M. BUCKLEY & A. JACKSON.

AUTOMATIC CAR BRAKE.

No. 273,344. Patented Mar. 6, 1883.

Fig. 1.



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(No Model.) 2 Sheets—Sheet 2.

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Fig. 2.

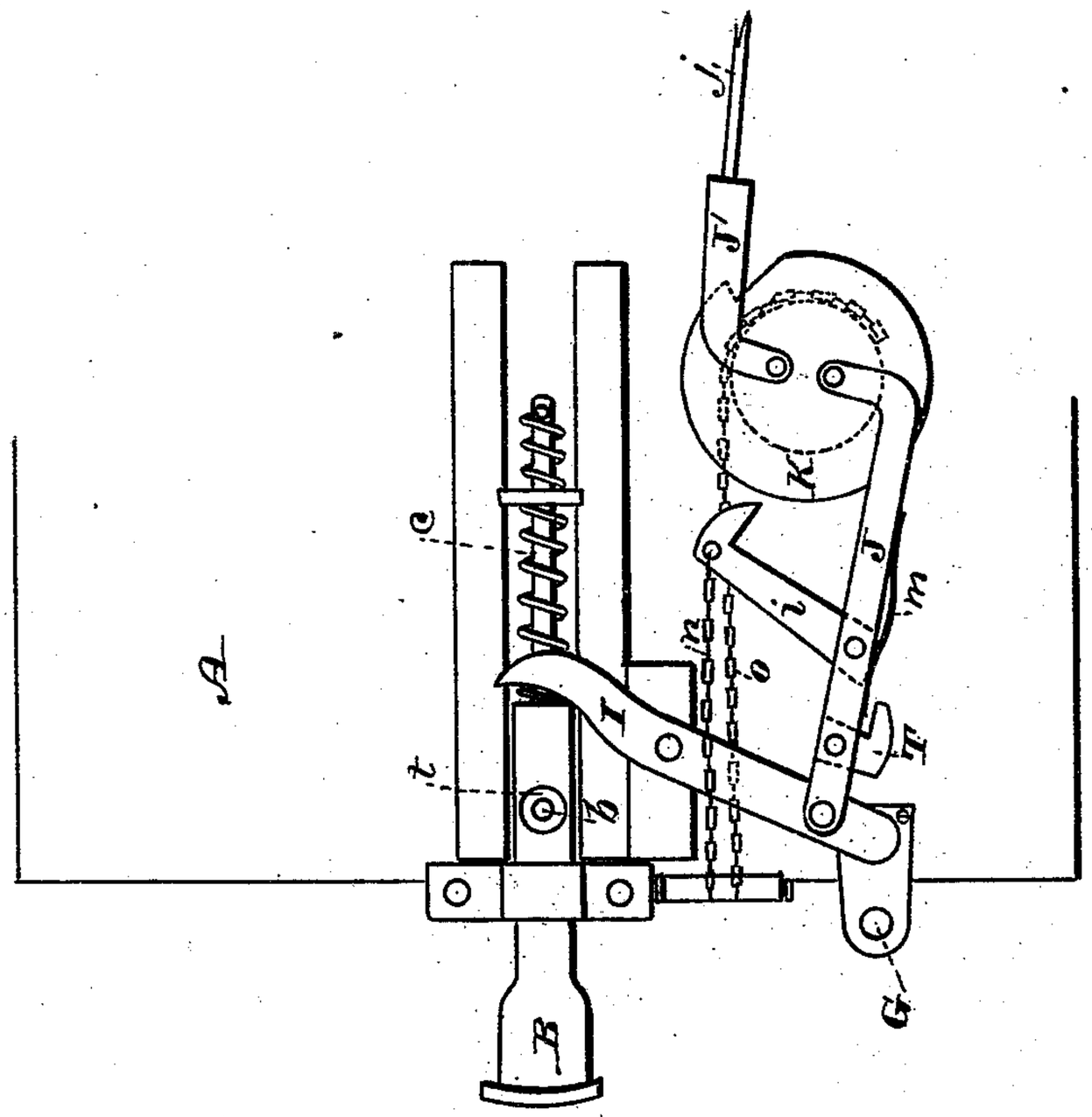
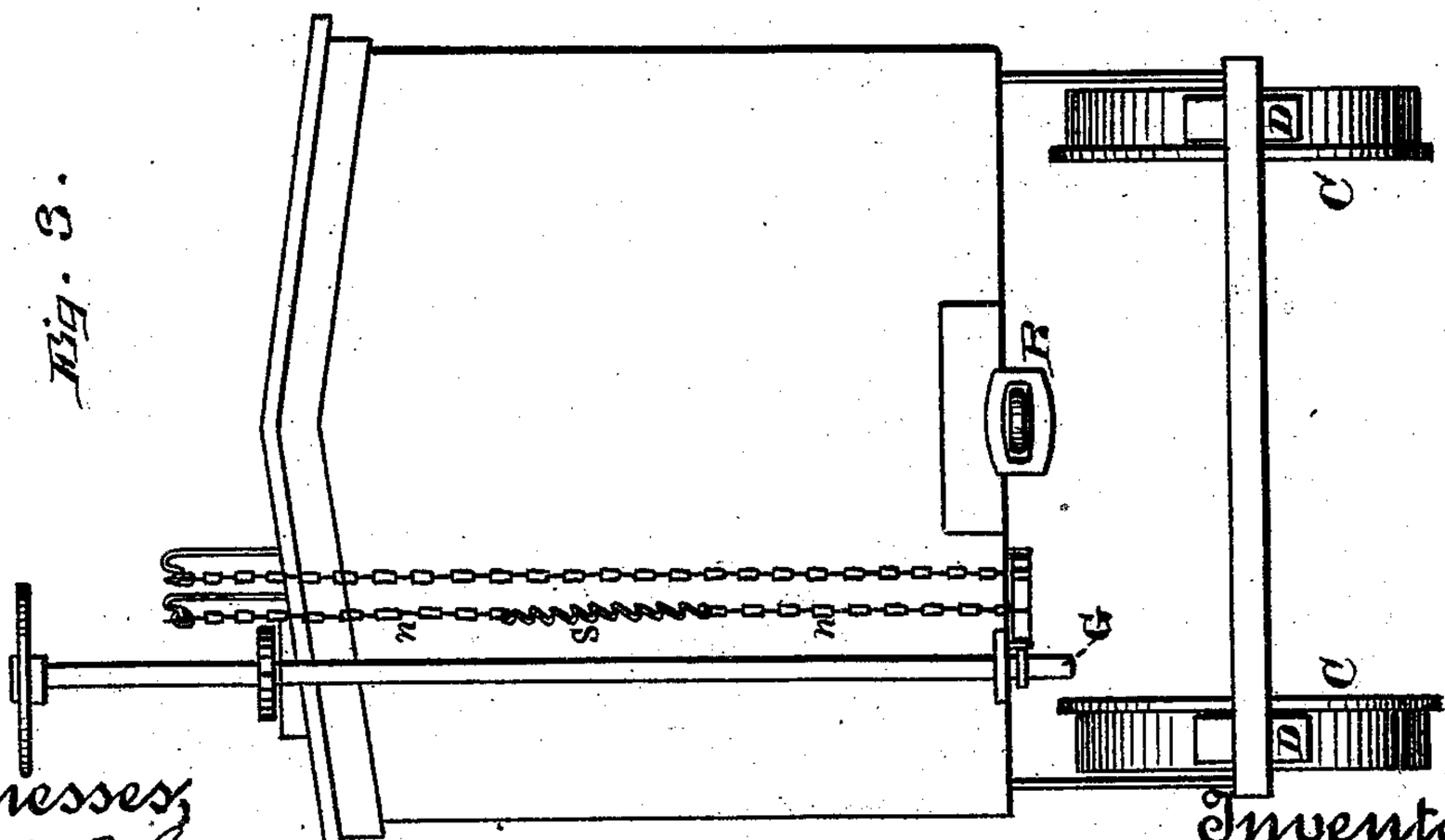


Fig. 3.



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UNITED STATES PATENT OFFICE.

EDWARD M. BUCKLEY AND ANDREW JACKSON, OF SAN FRANCISCO, CAL.

AUTOMATIC CAR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 273,344, dated March 6, 1883.

Application filed October 2, 1882. (No model.)

To all whom it may concern:

Be it known that we, EDWARD M. BUCKLEY and ANDREW JACKSON, of the city and county of San Francisco, State of California, have invented an Automatic Car-Brake; and we hereby declare the following to be a full, clear, and exact description thereof.

Our invention relates to a new and useful automatic car-brake; and it consists in a novel combination of devices for connecting the spring draw-head with the braking apparatus, whereby the motion of the former, when it impinges against the opposite draw-head, is transmitted to the brakes to apply them to the wheels. These means will hereinafter fully appear in the description, and be pointed out specially in the claims.

The object of our invention is to make each car brake itself by its own momentum; to make the force of the brakes depend upon the momentum, so that the braking operation shall be entirely automatic, and to provide a simple, cheap, and effective device for the purpose.

Referring to the accompanying drawings, Figure 1 is a bottom view of a portion of a car, showing our mechanism in engagement with the draw-head. Fig. 2 is an enlarged view of same, showing device out of engagement. Fig. 3 is an end view of the car.

Let A represent an ordinary freight-car, having the draw-head B, which is adapted, as is usual, to have a longitudinal play in suitable guides by means of a spring, *c*.

C represents the wheels, mounted on a suitable truck.

D D are the brakes, adapted to be forced against the wheels by means of the lever E, connecting-rods *e*, and main bar F, with which the chain *a*, attached to the end winding-spindle, G, is connected. This mechanism is the common form of brake now used on freight-cars, and its operation to apply all the brakes at once is well known and needs no further explanation.

The rod marked H, Fig. 1, is connected with the main bar F, and is supposed to extend to the brake mechanism upon the truck at the other end of the car, so that, as usual, by the operation of the crank-spindle G, the brakes may be applied at the same time to all the wheels of a car.

Under the car, Fig. 1, is pivoted a lever, I, the point of which lies under the shank of the draw-head B, and is adapted to be engaged by a pin or lug, *b*, extending from under the shank of the draw-head. With the end of this lever is connected a bar, J, the other end of which is bent, and is pivoted to the under side of a horizontal sheave or pulley, K. A similar bar, J′, is pivoted under said sheave, and is connected, either directly or through a rod, *j*, with the main bar F of the braking mechanism. The position in which the bars J J′ are pivoted under the sheave is shown in Fig. 1. They extend past each other and are bent inwardly, their points being placed nearly in the line of the same diameter of the sheave—one on each side of the center. When in the position shown in this figure, the bars J J′ and the intervening sheave, K, form a connection between the lever I and the main bar F of the brake mechanism, and it will be seen that this connection is at its shortest limit, because of the overlapping points of the bars J J′. When shortened up in this manner, the other end of the lever I is held against the lug *b* under the shank of the draw-head, and sufficient tension is brought upon the brake mechanism to have it in readiness to be applied when the lever I is moved; but to hold the sheave in the position shown it is provided with a notch, in which a pawl, *i*, pivoted to bar J, is held under the influence of a spring, *m*, impinging on its base. T is a guard for said spring *m*. Now, when the draw-head B is forced in, its lug *b* pushes back lever I, the other end of which draws on bar J. There being a rigid connection between the lever I and main bar F through bars J J′ and sheave K, the main bar F is drawn upon to apply all the brakes, as heretofore indicated. Herein lies the automatic action of the brake.

When cars are coupled together their draw-heads impinge whenever the momentum of one increases beyond that of the other. By the means here shown the moment that happens the car feels the influence of its brakes and slows up. It is at once relieved by the separation of the draw-heads, and may run freely until it again acquires momentum or the preceding car loses some of its headway. The effect of this is plain. Suppose a long train to be moving along and a point is reached where

it has to slow up. The engineer applies the regular brake upon the locomotive. The first car thereupon closes up on the tender, and by means of its draw-head all of its wheels are subjected to the brakes. So on throughout the entire train. It will also be seen that the force with which the brakes are applied may be regulated at will. The momentum determines it, and therefore, on a downgrade, the train need not move faster than the locomotive is permitted to travel. The moment one car acquires sufficient momentum it frees its brakes and is at once relieved from them, and according to the degree of its momentum the brakes are applied with more or less force. The engineer therefore has the entire train under his control. All that he has to do is to brake the locomotive and the train will accommodate itself thereto, even to stopping.

The great advantage of this device is, that each car performs its part, and therefore the brakes need not be applied with greater force than is necessary to brake a single car. This is a great saving, both on the wheels and track. On ordinary freight-trains there are usually enough brakemen to brake a certain small proportion of the entire number of cars. For instance, in a train of fifteen or twenty cars there may be three men, who brake six cars at different parts of the train. The wheels of these have to be locked firmly, because they are depended upon to stop the entire train. From this it will be seen what an advantage in wear and tear it is to make each car depend upon itself.

To complete this device we must have some means to throw it out of engagement when desired. There may be times when the automatic portion need not be used and the regular mechanism, through the crank-spindle G, be alone employed. As before mentioned, on account of the position of the bars J J′ upon the sheave, the connection between the lever I and bar F is at its shortest limit and is rigid; but if we turn the sheave to change the pivot-points of the bars J J′, as shown, the connection is materially lengthened and the play of lever I becomes insufficient to operate through this loose connection on the brake mechanism. This result we accomplish by means of a chain, *n*, attached to the pawl *i*, and thence passing up the end of the car to a hook or support on top, as shown in Fig. 3. The brakeman above, by drawing on this chain, withdraws pawl *i* from engagement with the sheave, and the first time the draw-head is forced back it moves lever I back, causing it to draw on bar J. The sheave, being free, is turned to carry the ends of the bars past each other and to lengthen out the connection, as shown in Fig. 2. There being now no strain on this connection, the lever I remains back where forced, as shown in Fig. 2, and the lug *b* no longer engages it. The pivots of the two bars J J′ on the sheave are nearly in line, and the force exerted to turn the sheave when the connection is shortened is for the most part resisted by the bars, and therefore the pawl *i* can easily hold the sheave and be as readily withdrawn. Then the force exerted is sufficient to turn it and lengthen out the connection. When it is desired to put it into engagement we turn the sheave back to the position shown in Fig. 1. This we accomplish by means of a chain, *o*, secured to the face of the sheave, as shown, and passing half around it. It is led up beside chain *n* to the top of the car, where it also is supported on a hook. By drawing on this chain the sheave may be turned to shorten up the connection for the purpose described. None of this mechanism interferes with the operation of the brakes through the spindle G and chain *a* when desired.

When the mechanism we have described is in engagement with the draw-head there must be some provision made against sudden jar. If the draw-head be forced in with great power, as is apt to happen, the brakes would be applied with such force as to do damage to the mechanism; but to prevent this, and to break the force of the bump on the draw-head, we make the bar J′, or its continuation *j*, pass through the main bar F and surround it with a suitable spring, *p*, as shown in Fig. 1. This has the desired effect of allowing the brakes to be applied with sufficient force, and no more.

In order to insure the removal of the pawl *i* from the notch of the sheave K, we have a spring, *s*, in the chain *n*, stronger than the spring *m*, under the influence of which it is held in engagement, so that when the chain *n* is hooked up the spring *s* will not allow the pawl to return to the notch.

The pin or lug *b*, under the shank of the draw-head, is provided with a friction-roller, *t*, to avoid wear.

Our device may be applied to passenger-coaches and street-cars as well.

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

1. The longitudinally-moving spring draw-head of a car and a braking apparatus in relation with its wheels, in combination with the pivoted lever I, engaging with a pin or lug, *b*, under the draw-head, and the devices connecting said lever with the braking apparatus, consisting of the bars J J′ and intervening sheave K, arranged and operating substantially as and for the purpose herein described.

2. The longitudinally-moving spring draw-head of a car and a braking apparatus in relation with its wheels, in combination with the pivoted lever I, engaging with a pin or lug, *b*, under the draw-head, the connection between the said lever and the braking apparatus consisting of the bars J J′ and intervening sheave K, said bars having bent inner ends and pivoted to the sheave on each side of the center, as shown, a means for turning the sheave and shortening the connection, as described, and a

means for disengaging said sheave to lengthen the connection, all arranged and operating substantially as herein described.

3. The longitudinally-moving spring draw-head B, having a lug or pin, *b*, extending from underneath, and the braking apparatus, consisting of the brakes D, levers E, connecting-rods *e*, and main bar F, all arranged as shown, in combination with the pivoted lever I, engaging with lug *b*, the bars J J′, and intervening sheave K, to which said bars are pivoted on each side of the center, as shown, and with which they form a connection between lever I and main bar F, the chain *o*, connected with the face of the sheave and passing up to the top of the car, the swinging spring-pawl *i*, engaging with a notch in the sheave, and the chain *n*, connected with the pawl *i*, and also passing up to the top of the car, all arranged and operating substantially as herein described.

4. The draw-head B, having a lug, *b*, and the main bar F of the braking apparatus, shown and described, in combination with the lever I, bar J, sheave K, bar J′, and its continuing rod *j*, passing through the main bar F of the braking apparatus, and the spring *p* in its end, to break the force of the draw-head on the brakes, substantially as herein described.

In witness whereof we hereunto set our hands.

EDWD. M. BUCKLEY.
ANDREW JACKSON.

Witnesses:
A. MAYERS,
J. H. BLOOD.