

A. H. FOX.
CAR BRAKE.

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UNITED STATES PATENT OFFICE.

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CAR-BRAKE.

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To all whom it may concern:

Be it known that I, ANSLEY H. FOX, a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Automatic Car-Brakes; and I do 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 the letters and figures of reference marked thereon, which form a part of this specification.

My invention has relation to improvements in automatic car-brakes.

The prime object of my invention is to provide a car-brake which is readily and conveniently thrown into and out of operation and which is automatically effective to apply and maintain the force of the brake to the wheels of the car.

A further object is to furnish an automatic car-brake economical in construction, practical in its operation, at the same time reducing the number of mechanical elements constituting an efficient brake to a minimum.

The above-named and such other objects as may appear from the ensuing description are accomplished by the device illustrated in the accompanying drawings, in which—

Figure 1 is a side view of the invention, showing it applied to a car of ordinary construction, the truck of the car being shown in dotted lines and the timbers of the car broken off at each end. Fig. 2 is a similar view illustrative of a slight modification of the invention.

A designates the floor of the car supported on trucks of the usual construction, as indicated in dotted lines in the drawings. Under the car-floor, supported in any suitable manner, is the operating rod or bar 1, intended to be operated from the ends of the car or from the locomotive by any suitable appliances and connections, adapted to impart either longitudinal or rotative motion to the said rod or bar effective to take up or let out the chains connecting the rod 1 to the brake-operating mechanism. In the drawings the rod 1 is designed to have a longitudinal movement.

At a convenient location on the timbers of

the car is arranged and secured a bracket 2, consisting, preferably, of two hangers or plates, (only one of which is shown,) and in the said bracket is suitably journaled two rollers 3^x, over which and between which a lifting medium, such as a chain 4, is arranged, having one end thereof secured to the rod or bar 1 and the other end connected to the mechanism which lifts and lowers the operating-chain.

On the mud-sill of the car or other support 5 is a bracket 6, provided with flanges 7, between which, at the upper portion thereof, is fulcrumed a lifting lever or arm 8, carrying in its free end a roller 9, on which the operating-chain is carried when lifted from engagement with the sprocket-wheel on the car-axle. The lower end of the lifting-chain 4 is connected to the free end of the lever or arm 8, so that when the chain is taken up by the operation of the actuating rod or bar the operating-chain will be disengaged from the sprocket-wheel on the axle. At the lower portion of the bracket 6 is journaled an idler sprocket-wheel or grooved pulley 10, constituting a guiding and carrying medium for that end of the sprocket-chain.

To the floor timbers of the car, at a suitable location, is secured a bracket 11, in which is journaled a sprocket-wheel 12, on which is arranged a sprocket-chain 13, carried over the roller 9 of the arm 8 and extending to and carried about the sprocket-wheel or pulley 10, which serves as a guide for the chain when in motion. On an axle of the truck is mounted a sprocket-wheel 14, which engages with the sprocket-chain 13 when the brake is brought into operation, as shown in Fig. 2, and which is free and disengaged from the sprocket-chain when the upper line thereof is lifted, as shown in Fig. 1 of the drawings. On the shaft of the sprocket-wheel 12 is mounted and secured to turn therewith a drum 15, to which is connected one end of a sprocket-chain 16, constituting the brake-chain, the other end of which chain is operatively connected to the brake bars or levers, so as to apply the brake-shoes to the wheels in the usual manner. In the bracket 11 is journaled the shaft 17, carrying the sprocket-wheel 18, the sprockets of which engage with the brake-chain 16 to hold the brake-shoes locked

against the wheels or to hold the said brake-shoes under any tension that may be desired by the motorman or operator. To hold the brake-chain taut and against return extension when it is brought into requisition to apply the brake, a ratchet-wheel 19 is fixed on the shaft 17, the ratchets of which are engaged by a pawl 20 pivotally supported on the bracket 11, substantially as shown in the drawings. To lift the pawl 20 from engagement with the ratchet so that the sprocket-wheel 18 may be free to rotate in reverse revolution by the weight of the brake in receding or swinging from contact with the wheel, a chain 21 is connected to the pawl and arranged between rollers 22 22^x, with its upper end secured to the actuating-rod 1, substantially as shown in the drawings.

It will be perceived that the lifting-chain 4 is held in tension or comparatively taut at all times by the weight of the mechanism connected thereto, so that its functions are positive and immediate to lift the operating-chain from engagement with the sprocket-wheel on the car-axle or to drop the sprocket-chain into engagement therewith. It will further be perceived that the pawl-lifting chain 21 hangs slack when the pawl is in engagement with the ratchet and remains so until drawn up to lift the pawl from the ratchet-wheel, which action is effected subsequent to the disengagement of the main sprocket-chain from the sprocket on the car-axle, owing to the difference of tension and slack of the respective chains, the purpose or object being that when the brakes have been applied and the desired or required tension attained, or the car has been stopped, the operating sprocket-chain may be rendered inoperative by disengagement and the pawl still be in engagement to hold the brakes against the wheel, and that the operative effect of the brake-bar chains shall be in succession in lifting or lowering, that of the chain 4 preceding in either direction that of the chain 21.

In Fig. 2 of the drawings is shown a modified construction of the invention, wherein the idler sprocket-wheel or guide-pulley is journaled in an arm pivotally supported in the support on the mud-sill and the lifting-chain is secured to the end of the arm, whereby when the arm is lifted the operating-chain is disengaged from the sprocket on the car-axle.

It will be observed that the lower portion or line of the main sprocket-wheel 13 may be lifted into contact with the sprocket-wheel on the car-axle instead of the upper portion or line of said sprocket-chain, and when desired to release the lower line of the chain from contact it will only be necessary to release the same, when it will readily disengage of its own weight.

The operation is as follows: Normally the mechanism stands as illustrated in Fig. 1 of the drawings, the sprocket-chain being out of engagement with the sprocket on the car-

axle and the brake-chain slack and the pawl engaged with the ratchet. When the brakes are to be applied the sprocket-chain is lowered into engagement with the sprocket on the car-axle, and the mechanism is immediately set in motion by the momentum of the car to effect the pressure of the brake-shoes on the wheels, which movement continues until sufficient tension is obtained and until the car stops or until the sprocket-chain is again disengaged. When it is desired to release the brakes the brake-rod is shifted or rotated until sufficient tension is put on the pawl-chain to lift the pawl from engagement, when the brakes recede from the wheels.

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

1. In an automatic car-brake, the combination of an endless sprocket-chain, a sprocket-wheel on the axle of the car to operate the sprocket-chain, a support for the sprocket-chain in the front and rear of said axle, a brake-chain connected to one of the rotative supports of the sprocket-chain, and lever mechanism to lift and lower the sprocket-chain, from and into engagement with the sprocket-wheel on the car-axle, substantially as shown and described.

2. In an automatic car-brake, mechanism comprising a brake-chain, means for paying out and winding up the chain to effect the contact and release of the brakes, an actuating rod or bar, and two connections secured to and depending from said rod or bar, said connections being secured to a lever and pawl respectively, substantially as and for the purpose set forth.

3. An automatic car-brake, comprising a brake-chain, mechanism for winding up the chain, means for locking the brake-chain in a set position of tension, and an actuating rod or bar having two connections depending therefrom, one adapted to throw the winding mechanism out of gear and the other adapted to release the locking mechanism, substantially as shown and described.

4. In an automatic car-brake, the combination of a suitably-supported sprocket-chain, a sprocket-wheel on the car-axle to operate the sprocket-chain, a brake-chain connected to the rotative support of the sprocket-chain, a sprocket-wheel to engage the brake-chain, a pawl and ratchet to hold the latter said wheel from return motion, an actuating-rod, and connections between the said rod, whereby the sprocket-chain is lifted and lowered and the pawl is disengaged, substantially as described.

5. In an automatic car-brake, the combination of a car-axle provided with a sprocket-wheel, a sprocket-wheel provided with a drum, a rotative support for one end of a sprocket-chain, a sprocket-chain on the sprocket-wheel and support, a brake-rod, a lever in engagement with the sprocket-chain, a flexible connection between the lever and the actuating

or brake rod, and a brake-chain connected to the drum of the sprocket-wheel, substantially as described.

5 6. In an automatic car-brake, the combination of a car-axle provided with a sprocket-wheel, a suitably-supported sprocket-chain, an actuating rod or bar, a lever provided with a roller in its free end adapted to rest under and support the upper line of the sprocket-chain, a brake-chain connected to the rotating support of the sprocket-chain, a holding mechanism for the brake-chain consisting of a sprocket-wheel, a ratchet and a pawl; and connecting-chains between the actuating-bar, 15 the said lever, and the pawl, whereby the sprocket-chain can be lifted from engagement with the sprocket-wheel on the ratchet, and the pawl from engagement with the axle, substantially as and for the purpose described.

20 7. In combination with a brake-chain, and mechanism for paying out and winding up the chain to effect the contact and release of the brakes, of a locking means for holding the brake-chain in a set position of tension, comprising a sprocket-wheel adapted to engage 25 the links of the brake-chain as the same is being paid out or wound up, a ratchet integral with said sprocket-wheel, a pawl to engage the ratchet, and a flexible connection for lifting and lowering the pawl, substantially as shown and described.

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8. In an automatic car-brake, mechanism comprising a brake-rod, flexible connections secured to and adapted to be lengthened and shortened by the movements of said rod, a 35 suitably-supported sprocket-chain connected to one of said flexible connections to be raised and lowered thereby, a sprocket-wheel and a grooved pulley to support the sprocket-chain, a sprocket on the car-axle to impart motion 40 to said chain, a drum on the sprocket-wheel of the chain, a brake-chain having connection to the drum, a sprocket-wheel to engage the brake-chain, a ratchet-wheel on the sprocket, and a pawl to engage the ratchet 45 having the end of one of the flexible connections fixed thereto, substantially as and for the purpose specified.

9. In an automatic car-brake, an endless sprocket-chain supported by two wheels, and 50 a lever actuated through the medium of a bar to throw the said sprocket-chain into and out of engagement with a sprocket-wheel secured on the car-axle, substantially as shown and described.

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

ANSLEY H. FOX.

Witnesses:

HARRY Y. DAVIS,
CARRIE L. ACKER.