(No Model.)

W. M. HENDERSON.

Car Brake.

No. 232,030. Patented Sept. 7, 1880.

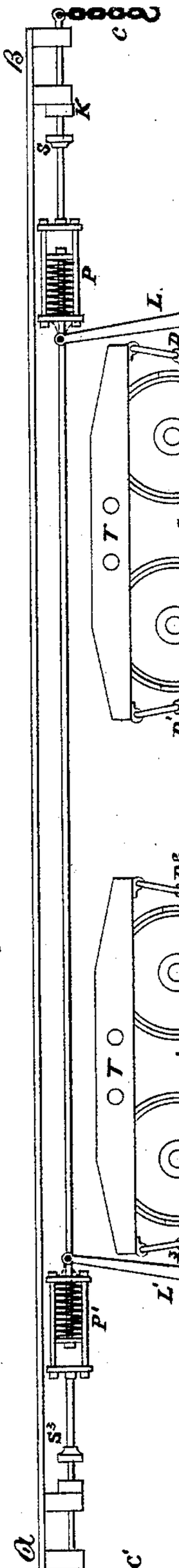

FIG 1

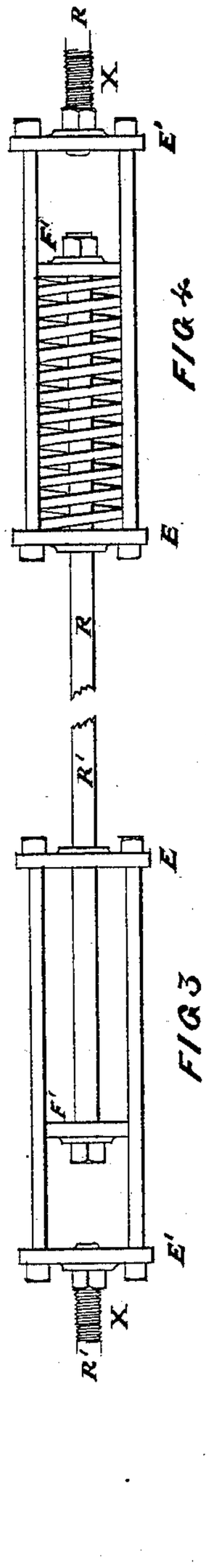

FIG 3

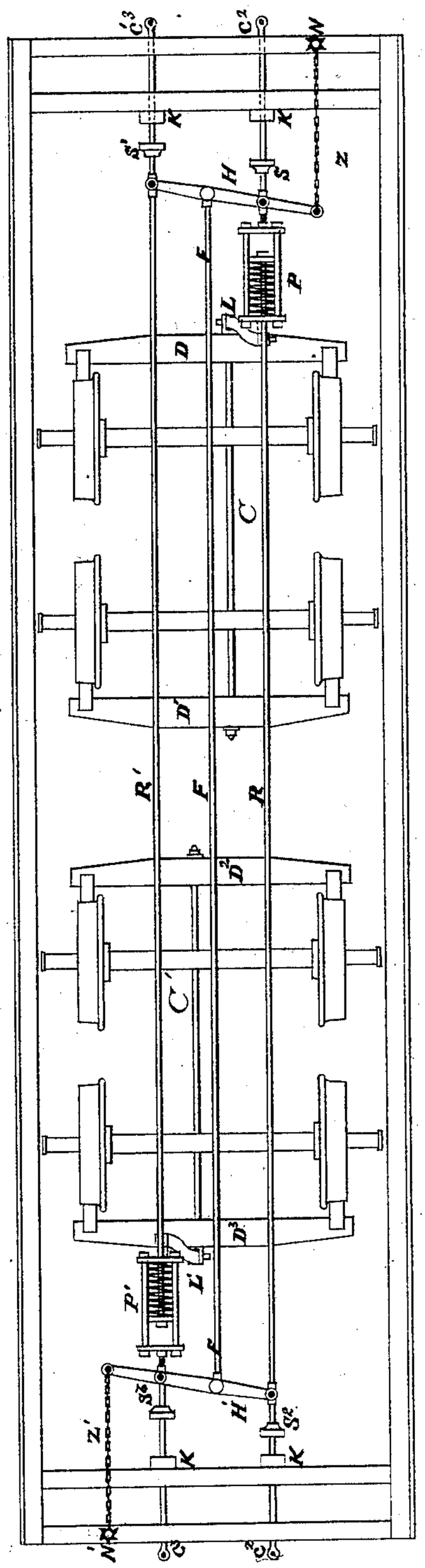

FIG 2

FIG 4

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CAR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 232,030, dated September 7, 1880.

Application filed May 31, 1880. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM M. HENDERSON, of Philadelphia, Pennsylvania, have invented certain new and useful Improvements in Power-Brakes for Railway-Cars; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, in which—

Figure 1 is a longitudinal side view of my improved braking apparatus as applied to a railroad-car. Fig. 2 is a plan view of the same; and Figs. 3 and 4 are enlarged views of the device employed for equalizing and distributing the braking-force throughout the several cars composing a train.

This invention is intended as an improvement upon that class of car-brakes which are operated by means of a continuous rod or rods which run throughout the several lengths of the cars and are complete between them, such braking apparatus being defective in this particular: The rods being continuous, and therefore rigid under tension from end to end, are incapable of applying an equal force to the several brakes, it being impracticable to so adjust the brake-shoes the lengths of the several rods, the pins, levers, or the coupling-connections between the several cars, that they shall all go on or off alike, or that they could be maintained in such precise condition in the working of a train of cars, even where the cars remain unchanged, and less so in the case of coupling up new cars.

In Fig. 1 T T are the two trucks of a railroad-car, line A B denoting the floor-line of the body of the car. Each truck is provided with the usual braking mechanism, which is too well known to require description. The brake-levers L L′ are severally connected to freely-moving brake-rods R R′, or to the cages, as shown in Figs. 1 and 2 in dotted lines, one placed on the right and the other on the left hand side of the car. These two rods run from end to end of the car, and connect to others similarly situated on the adjoining cars by the coupling-chains C C′ hooking into eyes C^2 C^3.

H H′ are two horizontal levers, forming a parallelogram with the two rods R R′. These levers have an extended arm, as shown, for connecting, by the chains Z Z′, with the usual hand-brake attachment.

N N′ are the brake-wheel ratchets. The fulcrum-centers of these levers H H′ are connected by a rod, F. Near each brake-lever L L′ the brake-rods R R′ are cut in two, and springs P P′ are interposed in cages, interrupting the continuity of the brake-rods.

It will be observed from the construction explained that the whole system of rods and levers is capable of free movement. Being connected to the brake-levers, as shown in Figs. 1 and 2, and to each other throughout the entire length of the train, and force being applied, either at the locomotive or at some other place on the forward part of the train, to draw the rod R′ to the right or forward, strain is put upon the brakes through the interposed springs throughout the whole train. Nor need this tension be remitted in order to release the train. It may be taken off from the whole train by drawing the rod R to the right through the connection C, or it may be taken from any particular car by the hand-lever and ratchet. It is immaterial, therefore, whether the brakes are applied directly by tension or indirectly by a reverse movement—*i. e.*, by releasing the force which holds them off—the action of the springs will equalize the braking force on all the brake-beams throughout the several cars, for as the brake-rods R R′ are not rigidly connected to each other or to the other part of the brake-rod running in the same line under the cars, or to the other rods running along under the other cars, which are similarly treated, the springs are unlimited in their action, and have as much control over the most distant brakes as over the nearest, and no single brake-beam can be applied before another. Attempting to do this causes one to become at once an abutment for transferring the surplus force to the others requiring it. Without some such transferring device it is plainly impossible to so arrange, adjust, and connect the several rods necessary to convey the power throughout the length of a train of cars each to the other and to the brake-levers as that they shall go on together with the same effect, and unless they do such brakes could not be maintained on a railroad. The brakes being

under pressure of that force necessary to apply them, if the brake-rod R is pulled to the right, the operation is to relieve the brakes by compression of the springs and to apply them when released, and if the same rod is pulled to the left the tendency of the spring is to apply the brakes under tension and release them when there is no tension on the rods.

To make the action upon the brakes the same, whichever end of the car comes forward to be coupled up, it is plain that if this car (shown in Fig. 2) is turned end for end c^3 will come where c is, and pulls in the same direction and with precisely the same effect. Suppose the brakes to have been applied by a continuous force, drawing R′ to the right by the chain C′, and the pull from the locomotive or otherwise to be on C, the effect is to compress spring P. The reaction of the spring pulls on the long length of rod R and withdraws the brakes by the action of the lever L and rod C on the two brake-beams D and D′, the force of the springs being calculated to have power enough to apply the brakes when released. Obviously the levers L L′ being connected, as shown in Figs. 1 and 2, to the cages would not materially change the mode of operation or effect.

From R the tensile force is transmitted by lever H′ to spring P′, and through it to the rod R′, which will operate lever L′ and its corresponding brake. At the same time the pull is going on throughout the length of the rod R, and is communicated to all the other rods on that side of the train, operating the several brakes in the same manner as just described.

The brake-rods may be operated by any suitable mechanism, such as a special steam-cylinder attached to the locomotive and under the control of the driver.

Stops S S′ are secured to and near each end of the main brake-rods, inside the cross-timbers of the body of the car, having rubber cushions K K to limit the pull on the brake-rods in such case as a train breaking in two.

The pins which secure the coupling-chains to the ends of the brake-rods are purposely made weaker than any other part subjected to the pulling-strain, to give way in such event, saving the other parts from injury.

Fig. 3 shows the form of cage employed for holding the springs, and Fig. 4 shows the cage complete with spring in position. The cage is composed simply of two plates, E E′, held apart by rods, as shown.

F is a washer secured to the end of one section of brake-rod, the spring being embraced between this washer and plate E.

To take up the lost motion and to adjust the length of the main brake-rods to make a proper connection between the cars, the adjusting-screws X X are provided, or turn-buckles may be introduced on the length of the rods R R′ for the same purpose.

In making up a train the hand-brakes are used to extend the brake-rods to facilitate coupling up, but the hand-brakes must always be off when the train is in motion.

It will be observed that when cars fitted with this improved brake are disconnected from the train the hand-braking apparatus can be used to operate the brakes in the same manner as when connected to the engine.

I am aware that the use of continuous rods and other similar coupled connections to apply brakes on railroad-cars directly by tension and indirectly by a reverse movement have been repeatedly suggested, and that springs of various forms have been proposed, both to apply the brakes when released and also to relieve them under the same conditions, such springs being invariably placed outside the main brake-rods, which could not produce, either by themselves or in combination with a rigid rod, an equalizing effect on the several brake-beams, and I disclaim the use of any such rods or springs in this connection.

What I claim, and desire to secure by Letters Patent, is—

1. The combination of the braking mechanism of a railroad-car with the brake-rods R R′, the continuity of which is interrupted by springs P P′, or their equivalents, said rods extending the entire length of the car and being provided at their ends with means for connection with like rods on contiguous cars, thereby communicating an equal motion to the brake-rods of a train of cars, substantially in the manner set forth.

2. The combination of the brake-rods R R′, provided with interposed springs, with the levers H H, describing a connected parallelogram, said rods and levers being connected with the ordinary braking mechanism and operating substantially as and for the purpose represented.

3. The right and left elastic brake-rods, R R′, arranged in relation to each other and to the levers and brake mechanism, and adapted to move freely on the car, substantially as described, and connected to the levers and brake-mechanism, whereby the brake-shoes are operated by their joint action in the same direction by tension applied from either end of the car, substantially in the manner and by the means described.

4. The elastic brake-rods R R′ and levers H H′, in combination with the hand brake-operating mechanism of a railroad-car, substantially as herein set forth.

5. In combination with the sliding rods and the levers, in described relation to the brake mechanism, the stops on said rods, with or without the elastic pads on the frame, substantially as described.

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Witnesses:
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R. W. ARCHBALD.