

(No Model.)

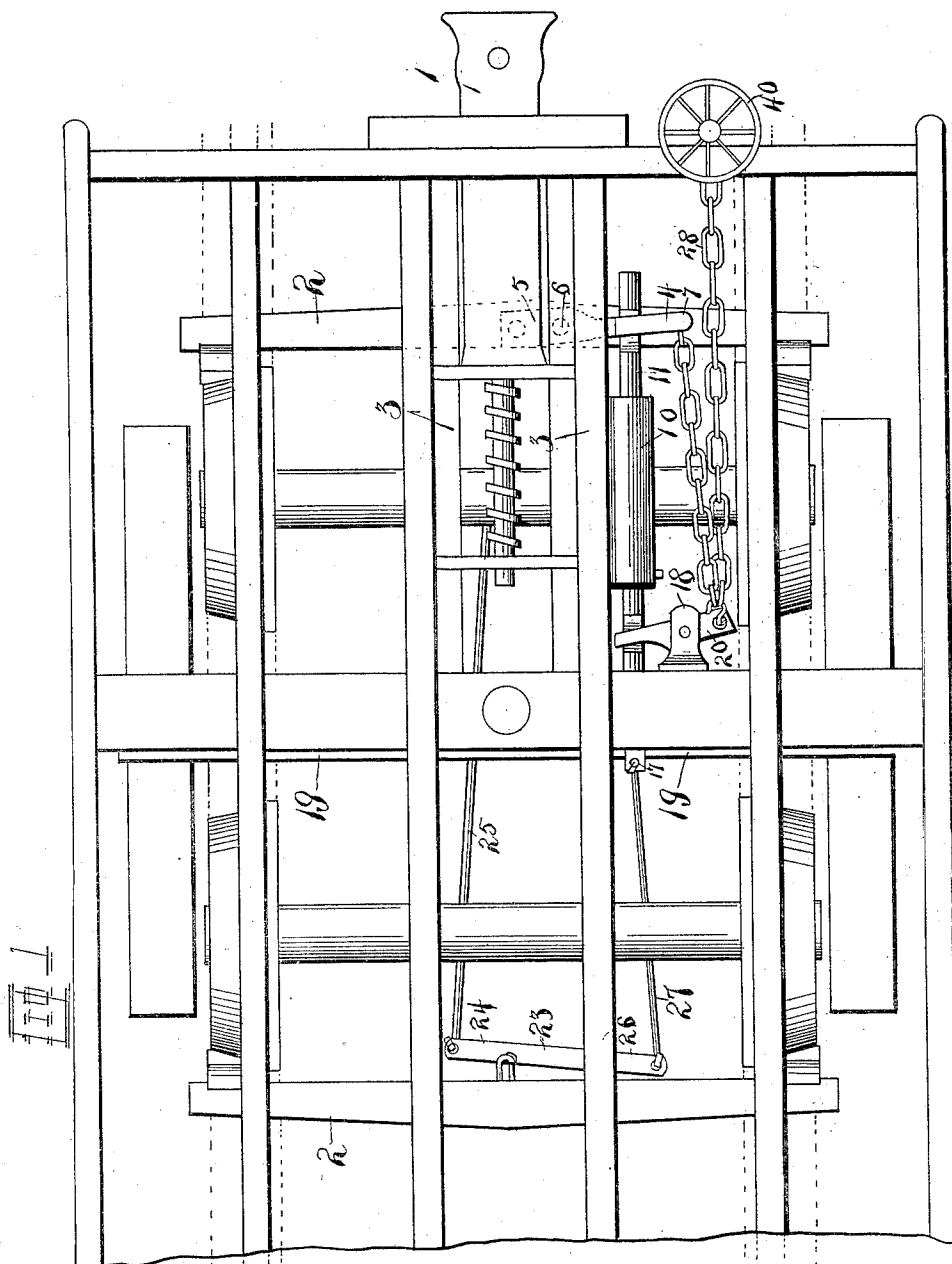
2 Sheets—Sheet 1.

L. H. MAIN & C. McMAHAN.

AUTOMATIC BRAKE FOR CARS.

No. 467,508.

Patented Jan. 26, 1892.



WITNESSES
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Ed. S. Langan

INVENTORS
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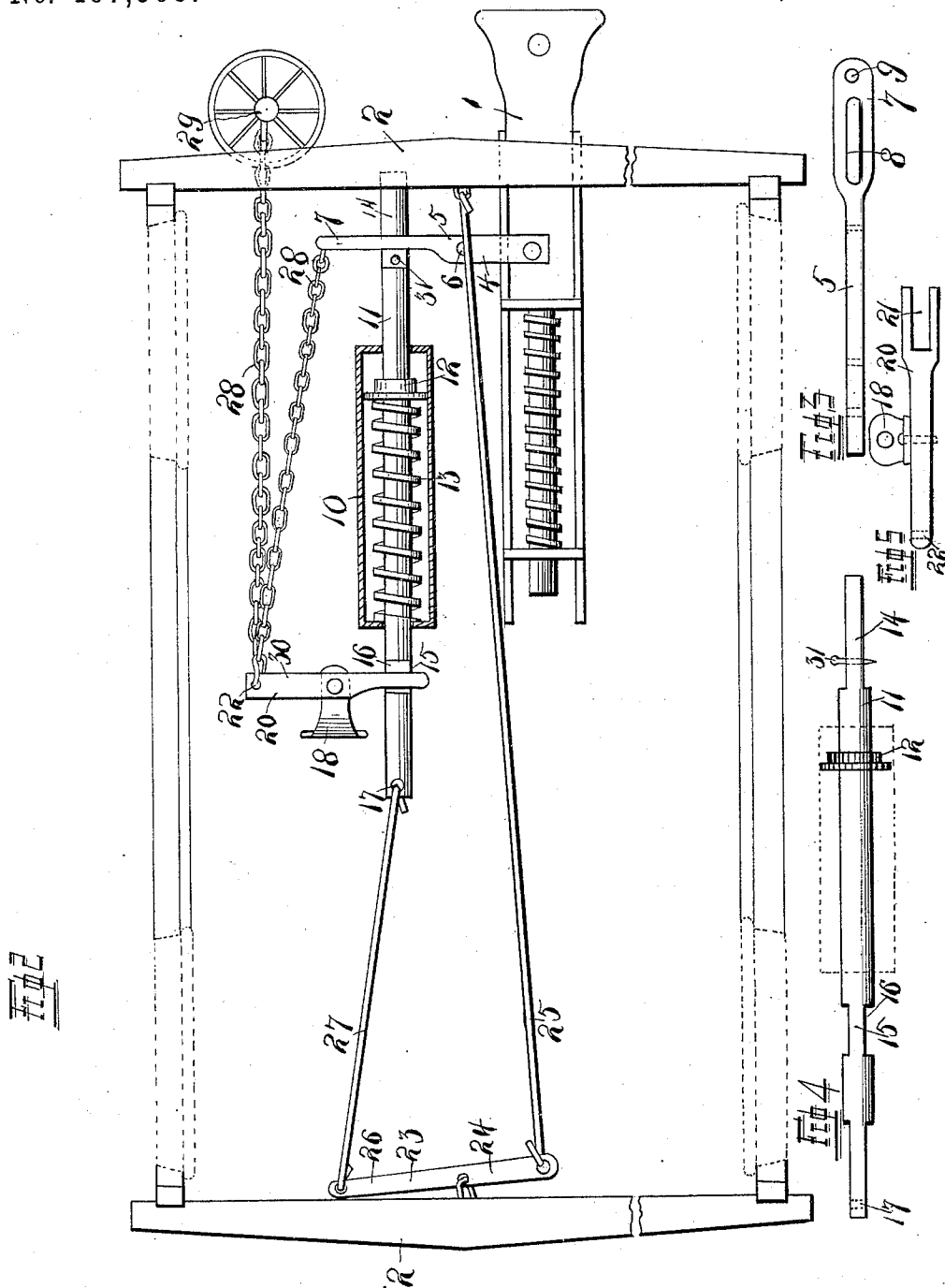
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UNITED STATES PATENT OFFICE.

LEONIDAS H. MAIN AND CORNELIUS McMAHAN, OF SPIRIT LAKE, IOWA.

AUTOMATIC BRAKE FOR CARS.

SPECIFICATION forming part of Letters Patent No. 467,508, dated January 26, 1892.

Application filed August 10, 1891. Serial No. 402,294. (No model.)

To all whom it may concern:

Be it known that we, LEONIDAS H. MAIN and CORNELIUS McMAHAN, of Spirit Lake, Dickinson county, State of Iowa, have invented certain new and useful Improvements in Automatic Spring-Brakes for Cars, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

Our invention relates to improvements in automatic spring-brakes for cars; and it consists in the novel arrangement and combination of parts, as will be more fully hereinafter described, and designated in the claims.

In the drawings, Figure 1 is a top plan view of a truck, showing our invention applied thereto. Fig. 2 is a bottom plan view of the brake-beams and draw-bar, showing our invention applied thereto, and also a sectional view of a cylinder which we employ in carrying out our invention. Fig. 3 is a detail view of lever which we employ in carrying out our invention; and Figs. 4 and 5 are detail views of a piston-rod and lever which we employ in carrying out our invention.

The object of our invention is to construct a mechanism for car-brakes so devised that whenever there is no pressure or power applied to the draw-bar the brakes are set; but whenever power or pressure is applied to the draw-bar the brake-shoes are automatically released from pressing on the wheels.

Referring to the drawings, 1 indicates a draw-bar of the ordinary construction, and 2 the brake-beams, which are also of the ordinary construction.

3 indicates the timbers between which the draw-bar slides. Pivottally secured to the draw-bar 1 is an arm 4 of a lever 5. Said lever 5 is fulcrumed on the side timber 3 by means of a screw or bolt 6. The arm 7 of said lever is provided with an elongated slot 8 and a perforation 9, for the purposes more fully hereinafter described.

Secured to the side bar 3 in any suitable and mechanical manner is a cylinder 10, of the construction as illustrated in Figs. 1 and 2. Said cylinder for large and heavy cars should be made of cast-iron and be provided with removable heads, the heads to be secured to the cylinder in any suitable and well-known manner.

Located in the cylinder 10 and adapted to reciprocate therein is a piston-rod 11 of the construction as illustrated in Fig. 2. Said piston-rod 11 is provided with a shoulder or collar 12. Located in said cylinder 10 and mounted on said piston-rod 11 is a heavy spiral spring 13, one end of which rests and presses against the shoulder 12 of the piston-rod 11, and the opposite end thereof presses against the head of the cylinder, referring to Fig. 2 for illustration. Said spring should be made very heavy and should have a pressure of about five or six hundred pounds, so that the strength imparted by the elasticity thereof to the brake-shoes in the manner as will be more specifically hereinafter described will not be great enough to cause the wheels of the car to slide. Said piston-rod 11 is provided on its front end with a decreased flattened portion 14, said portion adapted to freely pass through the elongated slot 8. The opposite end of said piston-rod 11 is provided with a decreased portion 15, arising from recesses 16, being cut out of opposite sides of said piston-rod, and the extreme rear terminal of said piston-rod is provided with a hole 17, for the purpose hereinafter described.

18 indicates a bracket or support of the construction as illustrated in Figs. 3 and 2. One end of said bracket or support is secured to the car-timber 19, and pivottally secured to the other end in any suitable and mechanical manner is a lever 20, of the construction as shown in Figs. 2 and 3. One arm of said lever 20 is provided with a U-shaped recess 21, into which the decreased portion 15 of the piston-rod 11 is adapted to fit, and the opposite end of said lever 20 is provided with a hole 22, for the purpose more fully hereinafter described.

Pivottally secured to the rear brake-beam 2 is a lever 23, one arm 24 of which is pivottally secured to a non-flexible rod 25, and the other arm 26 of said lever is likewise secured to one end of a non-flexible rod 27. The other end of said non-flexible rod 27 is pivottally secured to the piston-rod 11 by the end of said rod 27 being passed through the perforation 17, as illustrated in Figs. 1 and 2. The other end of the non-flexible rod 25 is pivottally secured in any suitable and mechanical manner to the front brake-beam 2, as illustrated

in Fig. 2. Arm 7 of lever 5 is secured to one end of the chain 28, and the other end of said chain is secured to a vertical shaft 29. Said chain 28 is secured intermediately to the lever 5 20, or more specifically to the arm 30 of said lever, as illustrated in Fig. 2. Lever 5 rests against a pin 31, which passes through the piston-rod 11, as illustrated in Figs. 2 and 4.

Having described the mechanical parts of our invention, we will now proceed to describe the operation of the same, referring to Figs. 1 and 2 for illustration.

It may be noted in this connection that spring 13 is the source of power—that is, the elasticity of said spring actuates the mechanism which sets the brakes, in the manner as we will now proceed to describe.

From the construction as hereinbefore set forth (referring to Fig. 2 for illustration) it can be readily perceived that the elasticity of spring 13 will impart a forward motion to the piston-rod 11. As said piston-rod moves forward it will carry with it a rod 27, and rod 27 will impart a forward motion to the arm 26 of lever 23, and said forward motion of said arm 26 will impart a rearward motion to arm 24 of said lever. The rearward motion of arm 24 will impart a rearward motion to the rod 25, and consequently draw the brake-beams 2 toward each other and set the brakes.

Having described the manner by which the brakes are set by the elasticity of the springs 13, we will now proceed to describe the manner by which the brakes are released when pressure is applied to the draw-bar 1. (Referring to Fig. 2 for illustration.) Whenever the draw-bar 1 is pushed backward, it will throw the arm 7 of lever 5 in a forward direction. Said forward motion of said arm will communicate a forward motion to arm 30 of lever 20, and said forward motion of arm 30 will communicate a rearward motion to rod 27, and consequently a similar motion to arm 26 of lever 23. The rearward motion of said arm 26 will produce a forward motion to arm 24, and the rearward motion of arm 24 will impart a forward motion to a rod 25 and consequently push the brake-beams 2 from each other and release the brake-shoes from the wheels.

Having described the manner of setting the brakes with the elasticity of the spring 13, located in cylinder 10 and the manner of releasing the same when pressure is applied to draw-bar 1 in a rearward direction, we will now proceed to describe the manner of releasing the brakes when power is applied to the draw-bar 1 in a forward direction. Whenever power is applied to the draw-bar 1, the arm 7 of lever 5 is thrown backwardly against the pin 31 and there meets with a resistance. The pressure applied by said arm against said pin will throw the piston-rod 11 in a rearward direction, and consequently push the arm 26 of lever 23 in a rearward direction. The rearward movement of arm 26 will communicate a forward movement to arm 24, which will consequently push the brake-beams 2 from

each other and release the brake-shoes from the wheels.

It may be noted in connection with the previously-described operation that the decreased portion 14 of the piston-rod 11 is free to move in the elongated slot 8 of the lever 5 in a backward direction without communicating any motion to said lever 5.

It is very often necessary to release the brake-shoes on the side tracks—that is, when there is no pressure or power applied to the draw-bar. To effect this result on flat or coal cars, we use a vertical shaft 29, with a wheel 40 mounted thereon for rotating the same. Secured to said shaft is a chain 28, and by winding up said chain 28 we can release the brakes in the manner as we will now proceed to describe. On box or stock cars a lever will be used attached to chain 28 and operated from the end and side of car. Said chain is also secured to the arm 30 of lever 20, and a similar chain 28 is secured to said arm 30, and also to arm 7 of lever 5. When lever-chain 28 is wound on this vertical shaft 29, the arm 30 of lever 20 will be pulled forward and consequently release the brakes, in a manner as before described. The forward motion of arm 30 and the rearward motion of arm 7 will impart or communicate a rearward motion to the piston-rod 11. The rearward motion of the piston-rod 11, in connection with the herein-described mechanism, will push the brake-beams 2 apart, and consequently release the brake-shoes.

It may be noted in this connection that we may use a continuous chain 28, as stated in the preceding part of this specification, or use two separate chains 28, one having its end connected to arms 7 and 30, respectively, and the other chain 28 having its ends connected to the vertical shaft 29 and also to arm 30 of lever 20.

Having fully described our invention, what we claim is—

1. Automatic spring-brakes for cars, having a cylinder, a piston-rod provided with a shoulder, mounted in said cylinder, a spiral spring mounted on said piston-rod within said cylinder and interposed between the head of said cylinder and said collar, a lever, such as 5, of the character described, pivotally secured to the draw-bar of the car and fulcrumed on the car-timbers, and one arm of said lever mounted on the front end of said piston-rod, a lever 20, mounted on the rear end of said piston-rod, a lever 23, pivotally secured to the brake-beams, a rod 27, secured to the rear end of said piston-rod and to the arm 26 of lever 23, and a rod 25, secured to the forward brake-beam and to arm 24 of lever 23, substantially as set forth.

2. Automatic spring-brakes for cars, having a cylinder 10, a piston-rod 11, provided with a collar and decreased portions 14 and 15, mounted in said cylinder, and a spiral spring 13, mounted within said cylinder on said piston-rod and interposed between the head of

said cylinder and the collar on said piston-rod, substantially as set forth.

3. Automatic spring-brakes for cars, having a lever 5, one arm of which is pivoted to the draw-bar, said lever being fulcrumed on the car-timber, a cylinder 10, a piston-rod 11, of the character described, mounted in said cylinder, one end of said piston-rod mounted in arm 7 of lever 5, a spiral spring 13, mounted on said piston-rod, a lever 20, of the character described, fulcrumed on a bracket 18, secured to the car-timber, in one arm of which said piston-rod is mounted and to the other arm thereto a chain 28 is secured, and the opposite end of said chain is secured to arm 7 of lever

5, a lever 23, secured to the rear brake-beam, a rod 27, secured to the rear end of said piston-rod and arm 26 of lever 23, a rod 25, one end of which is secured to arm 24 of lever 23, and the other end is secured to the front brake-beam, a vertical shaft 29, and a chain 28, secured to said shaft and arm 30 of lever 20, substantially as set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

LEONIDAS H. MAIN.

CORNELIUS McMAHAN.

Witnesses:

OLE BJÖRENSEN,
CHARLES MILLER.