

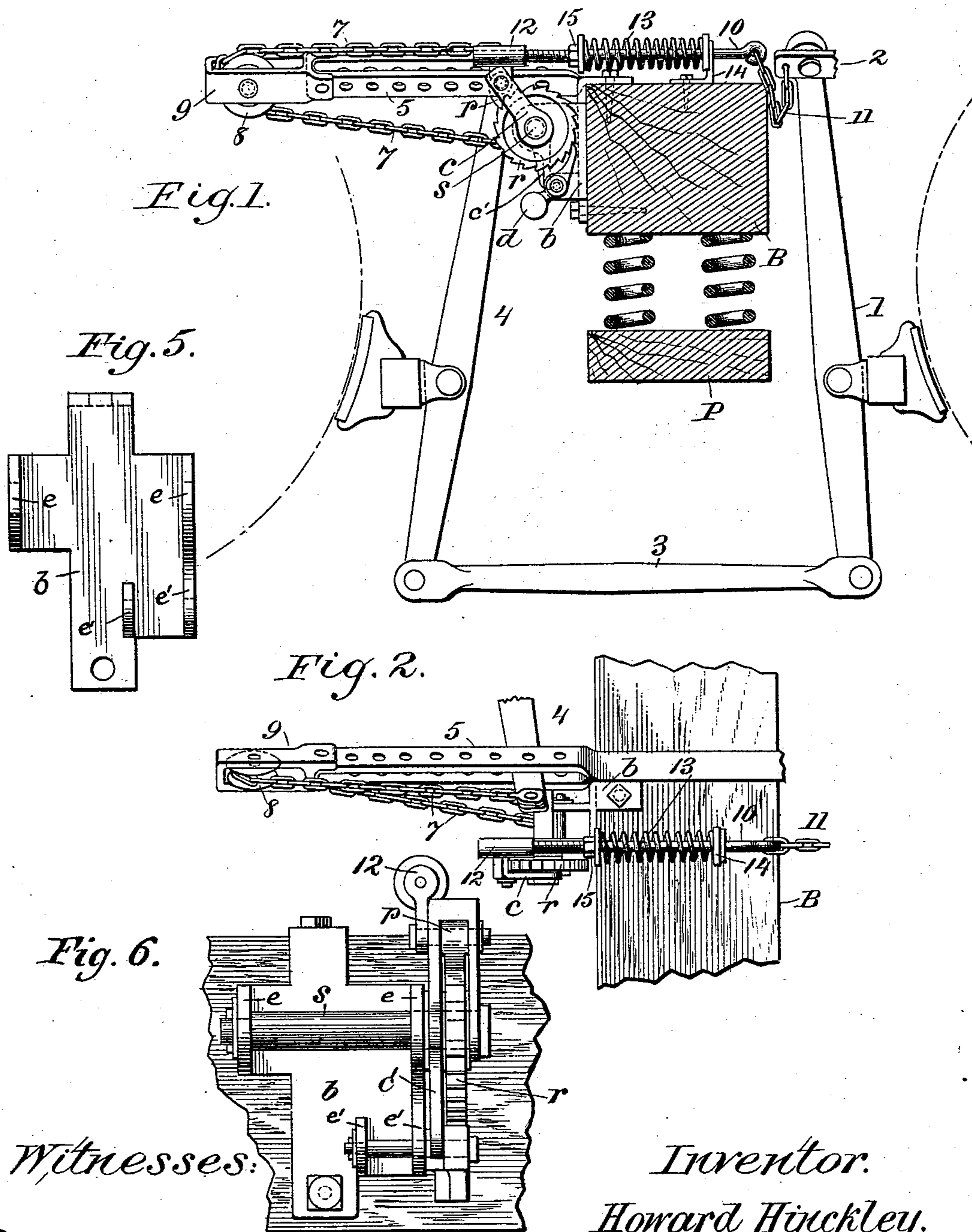
(No Model.)

2 Sheets—Sheet 1.

H. HINCKLEY.
SLACK TAKE-UP FOR CAR BRAKES.

No. 465,266.

Patented Dec. 15, 1891.



Witnesses:

J. A. Goodenough
J. H. Muir.

Inventor.

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By his attorney
F. C. Loring.

(No Model.)

2 Sheets—Sheet 2.

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Fig. 3.

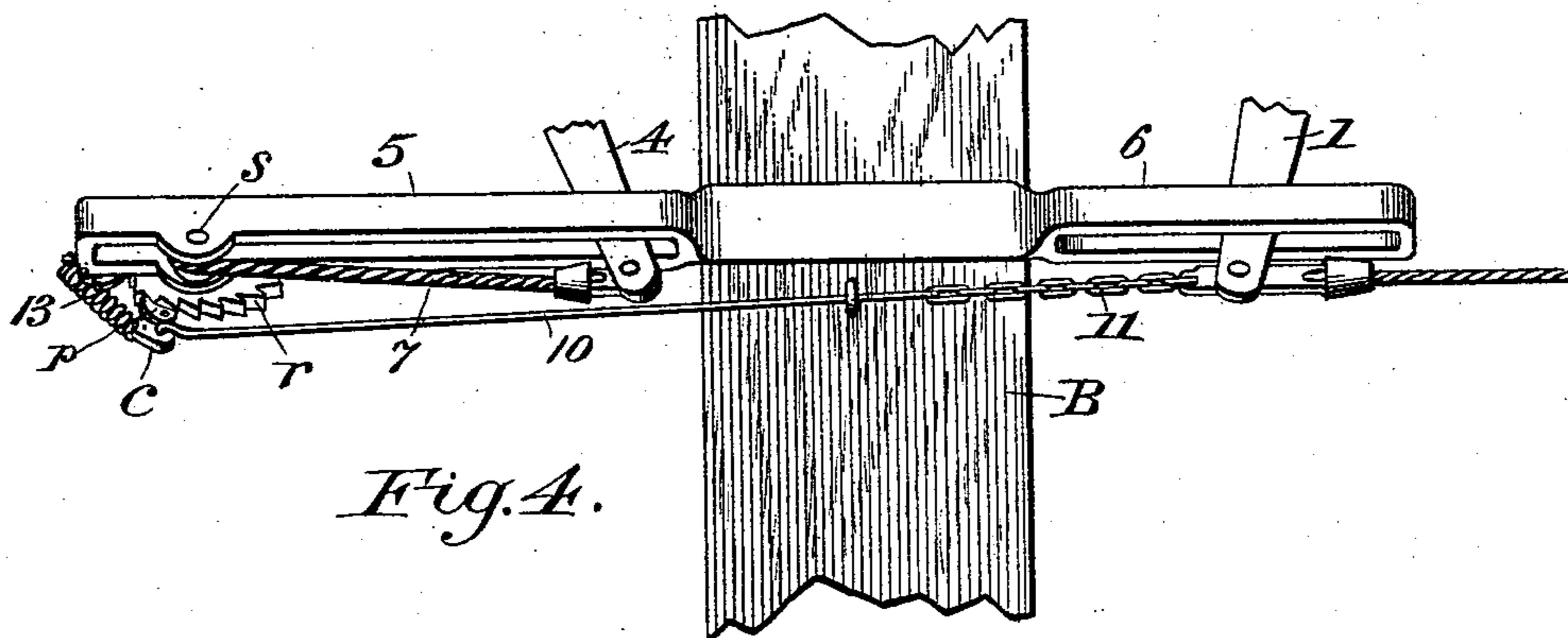
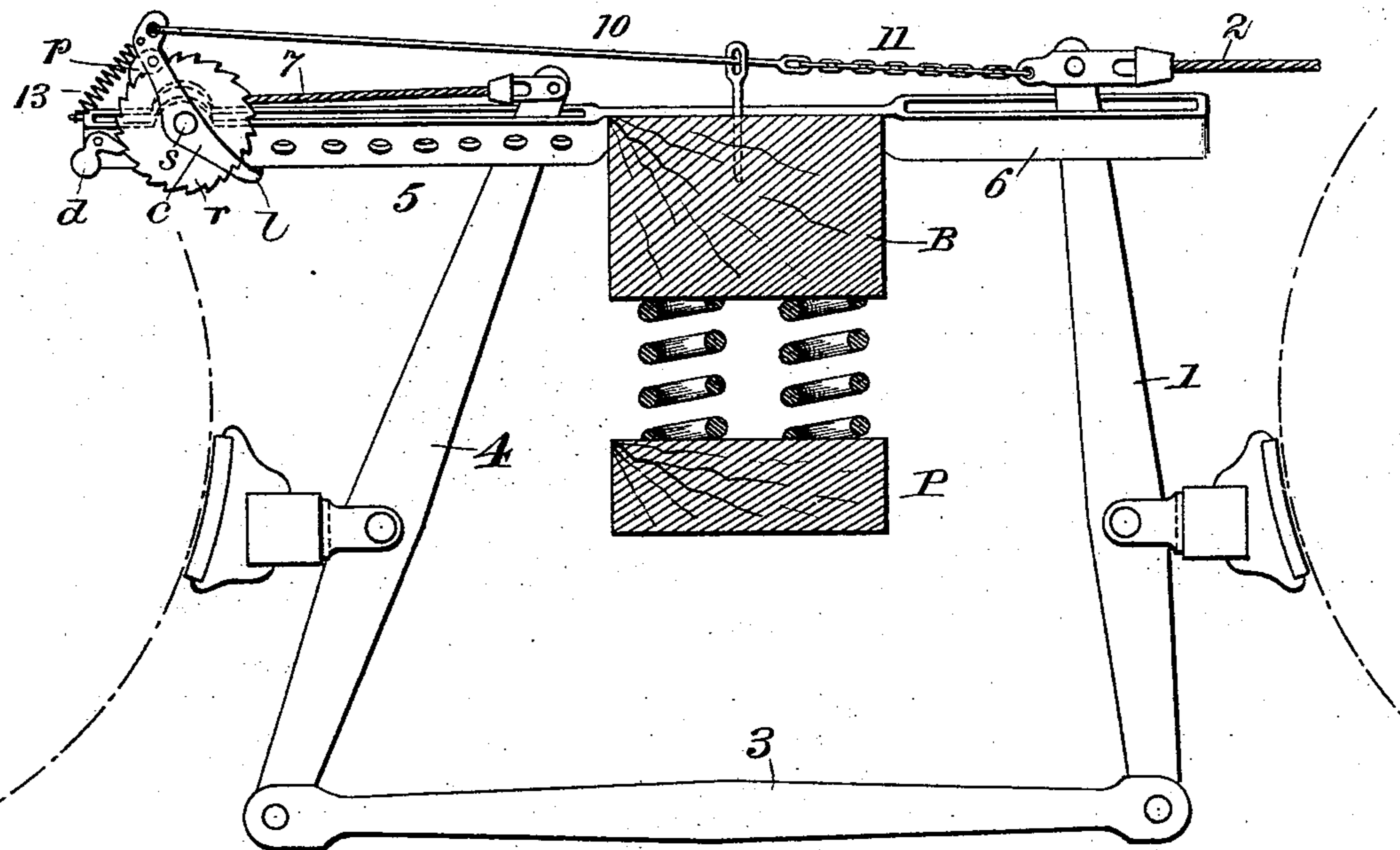


Fig. 4.

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UNITED STATES PATENT OFFICE.

HOWARD HINCKLEY, OF TRENTON, NEW JERSEY.

SLACK-TAKE-UP FOR CAR-BRAKES.

SPECIFICATION forming part of Letters Patent No. 465,266, dated December 15, 1891.

Application filed March 14, 1891. Serial No. 385,097. (No model.)

To all whom it may concern:

Be it known that I, HOWARD HINCKLEY, a citizen of the United States, residing at Trenton, in the county of Mercer and State of New Jersey, have invented certain new and useful Improvements in Car-Brakes; and I do hereby 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.

My present invention relates to automatic slack-take-ups for railway-car brakes, and has for its object to take up the slack caused by the wearing away of the brake-shoes by shifting the fulcrum of what is known as the "dead-lever" of the brake system.

In an application for Letters Patent of the United States filed by me August 22, 1890, Serial No. 362,715, I have described and claimed a form of apparatus for accomplishing this result resembling the present apparatus in many respects. In that arrangement, however, the fulcrum of the lever is shifted during the application of the brakes, whereas in the present arrangement the shifting takes place upon the release of the brakes at a moment when there is but little resistance to be overcome and when, consequently, comparatively little force is required to effect the desired object.

In the accompanying drawings, forming part of this specification, Figure 1 is a side elevation, and Fig. 2 a plan view, of my preferred form and arrangement of devices. Figs. 3 and 4 are respectively similar views of a modified apparatus having the same principle of operation, and Figs. 5 and 6 are respectively face views of the windlass-shaft-carrying bracket and of the said shaft and its operating mechanism.

In the several views, P denotes the spring-plank, and B the bolster, of the truck; 1, the "live-lever," so called; 2, the rod or rope by which this lever is actuated indirectly from the piston, diaphragm, or whatever other primary brake-operating mechanism is employed. The dead-lever is denoted by 4, and 3 indicates the link by which it is connected with and operated by the live-lever. The numeral 5 indicates the usual guide for the dead-lever, and 6 a guide within which the live-lever plays. These parts and their ar-

rangements and connections are common to well-known brake systems now in use and need no further description or explanation to enable their construction and operation to be understood.

In the old way of mounting the dead-lever it was pivoted upon a fulcrum-pin passing through the arms of the lever-guide, and when it became necessary to take up the slack the fulcrum-pin of the lever was shifted into another one of the holes formed in the lever-guide for that purpose. The lever-guides shown in the drawings are provided with these holes, not, however, because they are necessary or useful in my construction, but merely to indicate the applicability of my invention to the old form of lever-guide.

Instead of pivoting the dead-lever upon a fulcrum-pin fixed in the guide, as above explained, I connect its upper end to one end of a chain, rope, or other flexible connection 7, and the opposite end of this chain I connect to a windlass-shaft provided with means, to be presently described, for automatically turning it to wind up the chain. In this arrangement it will be understood that the end of the chain forms the fulcrum for the dead-lever, the same as in my other application referred to, and that this fulcrum may be shifted along the lever-guide by taking up or letting out the chain.

I will now describe the means for shifting this fulcrum. In my preferred arrangement (shown in Figs. 1 and 2) the windlass-shaft *s* is mounted in a suitable bracket *b*, rigidly secured in place on the truck-bolster B. This bracket is preferably constructed as shown in Fig. 5, and is secured to the bolster by means of flanges, as shown. It is provided with ears *e*, in which the windlass-shaft *s* has its bearings, and also with bearings for the shaft of the locking-dog *d* in lugs or ears *e'*. The windlass-shaft is provided on one end outside of the ear *e* with a ratchet-wheel *r*, and the locking-dog *d* is journaled or pivoted so as to engage the ratchet-wheel and prevent retrograde movement of the shaft and the letting out of the chain, the dog being weighted or provided with springs to hold it in engagement with the ratchet.

The numeral 8 denotes a guide-pulley, over which the chain 7, connecting the windlass-

shaft and the end of the dead-lever, is thrown. This pulley is required only in the arrangement shown in Figs. 1 and 2. It is mounted in or upon the outer end of the lever-guide, being shown in the drawings in a small bracket 9, bolted to the guide. It may, however, obviously be mounted in the bracket proper.

The mechanism for turning the windlass-shaft is as follows: Still referring more particularly to Figs. 1 and 2, *c* denotes a pawl-carrying arm pivoted upon the shaft-carrying bracket, preferably coincident with the axis of the shaft. In the construction shown on Sheet 1 of the drawings this arm is yoke-shaped, as shown in Fig. 6, and is journaled upon the windlass-shaft outside the bearing-lug *e* of the bracket *b*. It is arranged to straddle the ratchet-wheel *r*, as shown in Fig. 6, and one arm *c'* is extended down upon the opposite side of the pivot for a purpose presently to be described. At its upper outer end the arm *c* carries a weighted or spring-actuated pawl *p*, engaging the ratchet-wheel *r*, and adapted as the arm swings in one direction to slip over the teeth of the ratchet without moving the shaft and to engage the teeth and turn the shaft as the arm is moved in the opposite direction. This pawl-carrying arm *c* is connected with the live-lever 1 by means of a spring-rod 10. The rod is adjustably connected with the arm *c* by means of an interiorly-threaded thimble 12, working upon the threaded end of the rod, the object being to regulate the throw of the pawl-carrying arm. The opposite end of the rod 10 is preferably connected with the live-lever by a short chain or other flexible connection, as 11, to permit the lever to have a certain amount of movement independently of the rod. Encircling the rod is a stout coiled spring 13, reacting between a stop and guide 14 on the bolster and an adjustable button 15 on the rod, by means of which latter the tension of the spring is regulated. This spring is the immediate means for actuating the pawl-carrying arm and turning the shaft. Were not some stop provided to limit the movement of the pawl-carrying arm in an outward direction the spring would throw the pawl out of reach of the ratchet. To prevent this, the extension *c'* on the pawl-carrying arm is provided. This extension, as seen in Figs. 1 and 6, abuts against the shaft of the holding-dog or other fixed part of the device, and forms a stop to limit the outward throw of the arm *c*. The manner in which the spring is thrown into action will be understood from the description of the operation of the device.

The modification illustrated in Figs. 3 and 4 differs from the form just described only in the means for actuating the pawl-carrying arm and the location and arrangement of the windlass-shaft. In this form I mount the windlass-shaft upon the dead-lever guide at its outer end and dispense with the guide-pulley. All the other parts employed in op-

erating the shaft—such as the pawl-carrying arm, the retracting-spring, and the holding-dog—are also mounted upon the dead-lever guide, the spring being arranged to pull the arm for turning the shaft instead of pushing it, as in the other arrangement. In this form the shape of the arm is also slightly different, being extended across the face of the ratchet-wheel and provided with a lug *l* at its lower end, which abuts against the under side of the guide and serves to prevent the spring drawing the arm too far over. The spring is connected directly to one end of the arm and fastened at its opposite end to the guide, and acts by contraction to pull the arm, instead of by expansion to thrust it outward.

The construction and arrangement of parts constituting the invention being as above described, the operation will be readily understood by those skilled in the art to be, briefly, as follows: So long as the movement of the live-lever is normal and does not exceed its effective range the pawl-carrying arm will not be operated, owing to the flexible connection between the rod 10 and the lever; but when, by reason of the wearing away of the brake-shoes, a greater movement of the lever is required to apply the brakes and the chain 11 becomes taut, the lever will pull upon the rod 10, compressing the spring in the construction shown in Figs. 1 and 2, and distending it in the other arrangement, the pawl-carrying arm swinging on its pivot and the pawl slipping over one or more teeth of the ratchet-wheel. When the brakes are released, the spring 13, being no longer held under tension, acts to force or draw the arm *c* in the opposite direction, when the pawl *p*, catching into the teeth of the ratchet, turns the shaft and so draws upon the chain 7, shifting the fulcrum of the lever to a point nearer the outer end of its guide, restoring the relative arrangement and throw of the levers to their original setting. The holding-dog *d* then catches the ratchet and holds the shaft against retrograde movement. This operation is repeated as often as the wearing away of the shoes causes sufficient enlargement of the movement of the live-lever to swing the arm *c* sufficiently to cause its pawl to gain one or more teeth of the ratchet, thus automatically correcting this excess of movement of the live-lever. It will be noted that the spring, besides causing the shifting of the dead-lever fulcrum, also effects a quick release of the brakes.

In carrying out this invention I do not contemplate confining myself to the details of construction and arrangement of parts herein shown and described, as I deem the scope of the invention such as to warrant the use of a wide range of mechanical devices without departing from its spirit or the principle of its operation.

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

1. In a slack-take-up for railway-car brakes,

the combination, substantially as hereinbefore set forth, of the dead-lever, a shaft, a connection between the shaft and the lever, a spring-actuated device for turning the shaft, a locking-dog for holding the shaft against reverse rotation, and mechanism for throwing the spring-actuated device into action.

2. In a slack-take-up for railway-car brakes, the combination, substantially as hereinbefore set forth, of the dead-lever, a windlass-shaft, a flexible connection between the shaft and the lever, and means for automatically turning the shaft to shift the fulcrum of the lever upon the release of the brakes.

3. In a slack-take-up for railway-car brakes, the combination, substantially as hereinbefore set forth, of the dead-lever, a windlass-shaft, a flexible connection between the shaft and the lever, and a spring-actuated device for turning the shaft to shift the fulcrum of the lever, said spring device arranged to be thrown into action by the release of the brakes.

4. In a slack-take-up for railway-car brakes, the combination, substantially as hereinbefore set forth, of the live-lever, the dead-lever, a windlass-shaft, a flexible connection between the shaft and the dead-lever, a spring-actuated device for turning the shaft in one direction to shift the fulcrum of the dead-lever, a locking-dog to hold the shaft against reverse movement, and a connection between the spring-actuated device and the live-lever.

5. In a slack-take-up for railway-car brakes, the combination, substantially as hereinbefore set forth, of the live-lever, the dead-lever, a windlass-shaft, a flexible connection between the shaft and the dead-lever, a ratchet-wheel on the shaft, a pivoted arm carrying an actuating-pawl in engagement with the ratchet, a locking-dog also engaging the ratchet, a connection between the pawl-carrying arm and the live-lever whereby the arm is drawn forward as the brakes are applied, and a spring acting to return the arm and cause the pawl to turn the shaft and wind up the connection when the brakes are released.

6. In a slack-take-up for railway-car brakes, the combination, substantially as hereinbefore set forth, of the dead-lever, its guide, a

windlass-shaft journaled in bearings on the truck-bolster, a guide-pulley mounted in the lever-guide, and a flexible connection between the shaft and the lever, said connection running over the pulley in the lever-guide.

7. In a slack-take-up for railway-car brakes, the combination, substantially as hereinbefore set forth, of the truck-bolster, the windlass-shaft journaled in brackets secured thereto, a ratchet-wheel on the shaft, a pivoted arm carrying a pawl engaging the ratchet, an operating-rod connected with the arm, a stop on the bolster, a button on the rod, and a coiled spring encircling the rod between the stop and button.

8. In a slack-take-up for railway-car brakes, the combination, substantially as hereinbefore set forth, of the live-lever, the dead-lever, a windlass-shaft, a flexible connection between the shaft and the lever, a ratchet on the shaft, a pivoted arm carrying a pawl engaging the ratchet, a rod connected at one end with the arm and having a loose or flexible connection with the live-lever, and a spring arranged to throw the pawl-carrying arm in a reverse direction to the movement of the live-lever in applying the brakes.

9. In a slack-take-up for railway-car brakes, the combination, substantially as hereinbefore set forth, of the dead-lever, a shaft, a connection between the shaft and the lever, a spring-actuated device for turning the shaft, and mechanism for throwing the spring-actuated device into action.

10. In a slack-take-up for railway-car brakes, the combination, substantially as hereinbefore set forth, of the windlass-shaft, a ratchet-wheel thereon, a pivoted arm carrying a pawl engaging the ratchet, a spring for throwing the arm in a direction to turn the shaft, and a stop to limit the forward movement of the arm.

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

HOWARD HINCKLEY.

Witnesses:

L. SCHOONOVER,

S. B. HUTCHINSON.