(No Model.)

3 Sheets—Sheet 1.

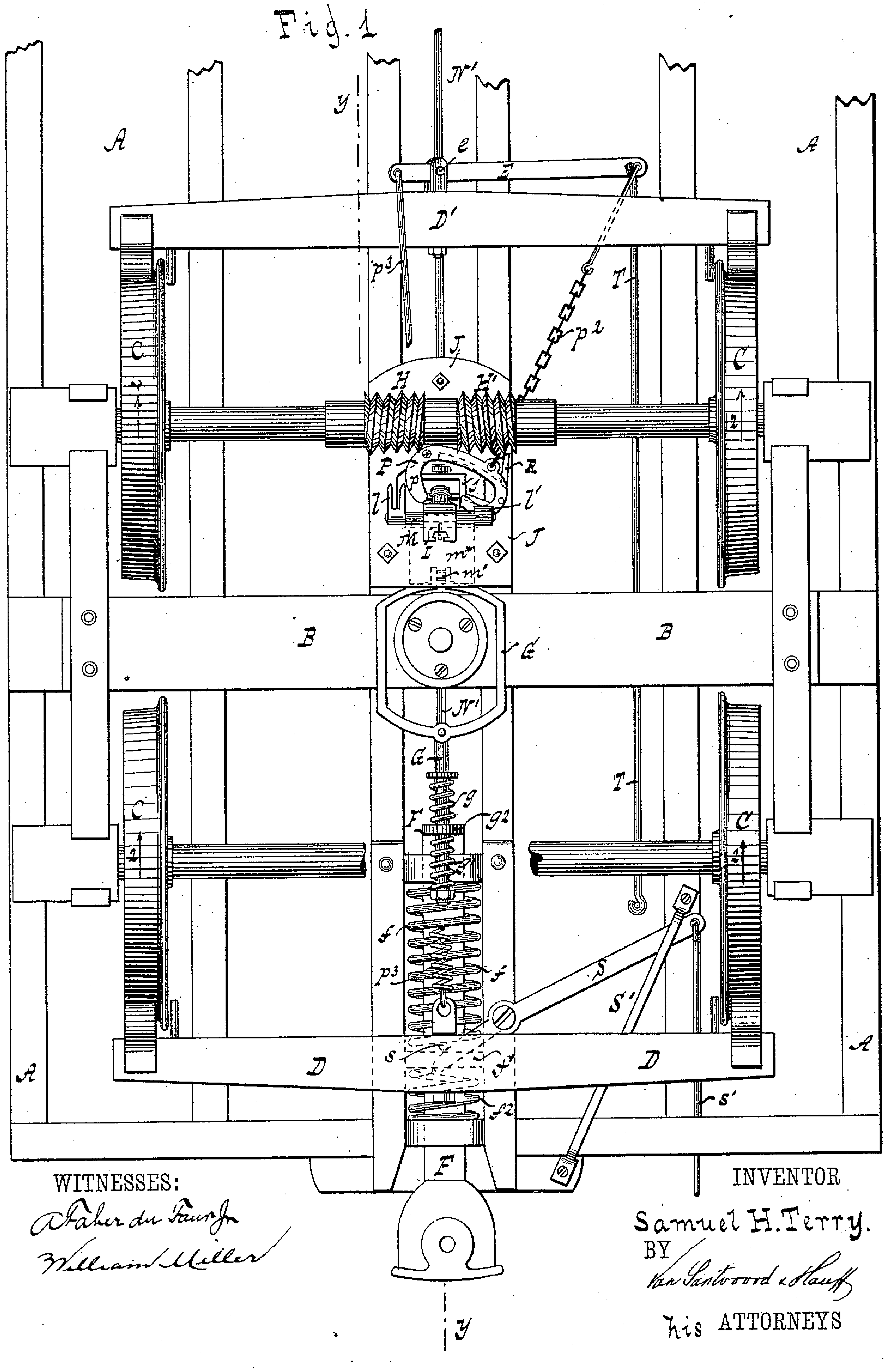
S. H. TERRY.

CAR BRAKE.

No. 345,263.

Patented July 6, 1886.

Fig. 1



WITNESSES:

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William Miller

INVENTOR

Samuel H. Terry.

BY

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his ATTORNEYS

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(No Model.)

3 Sheets—Sheet 2.

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Fig. 2.

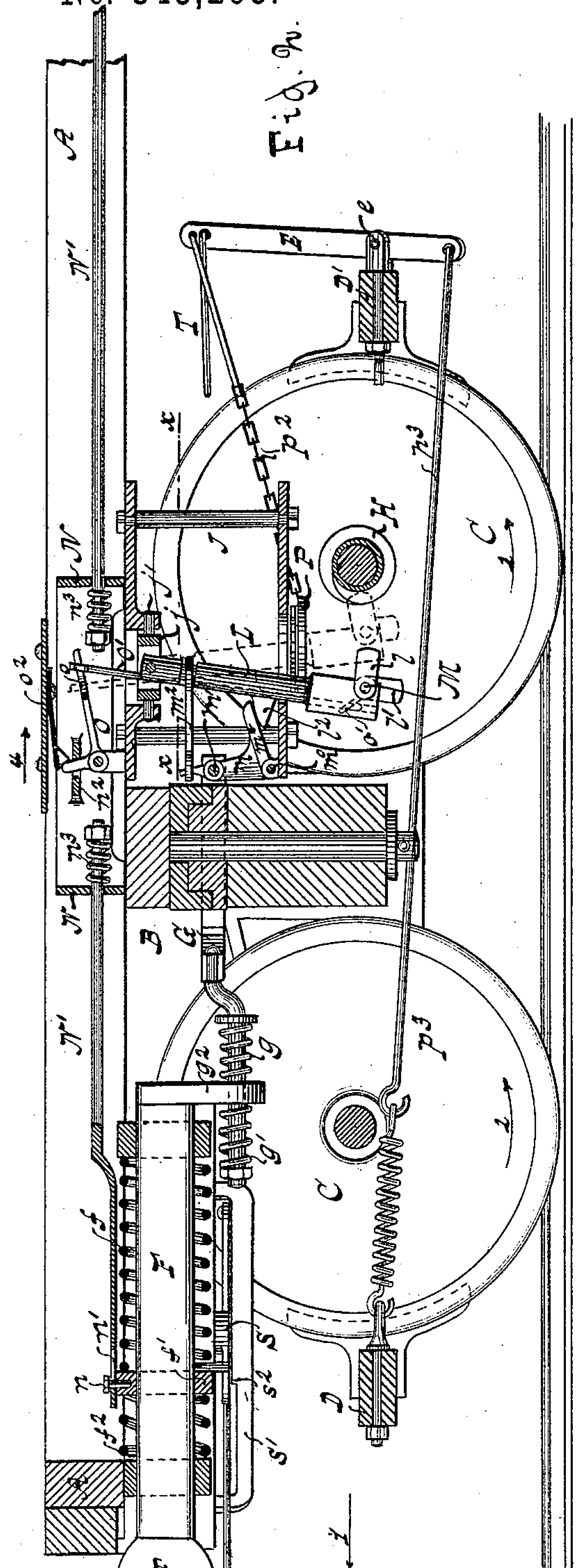


Fig. 4.

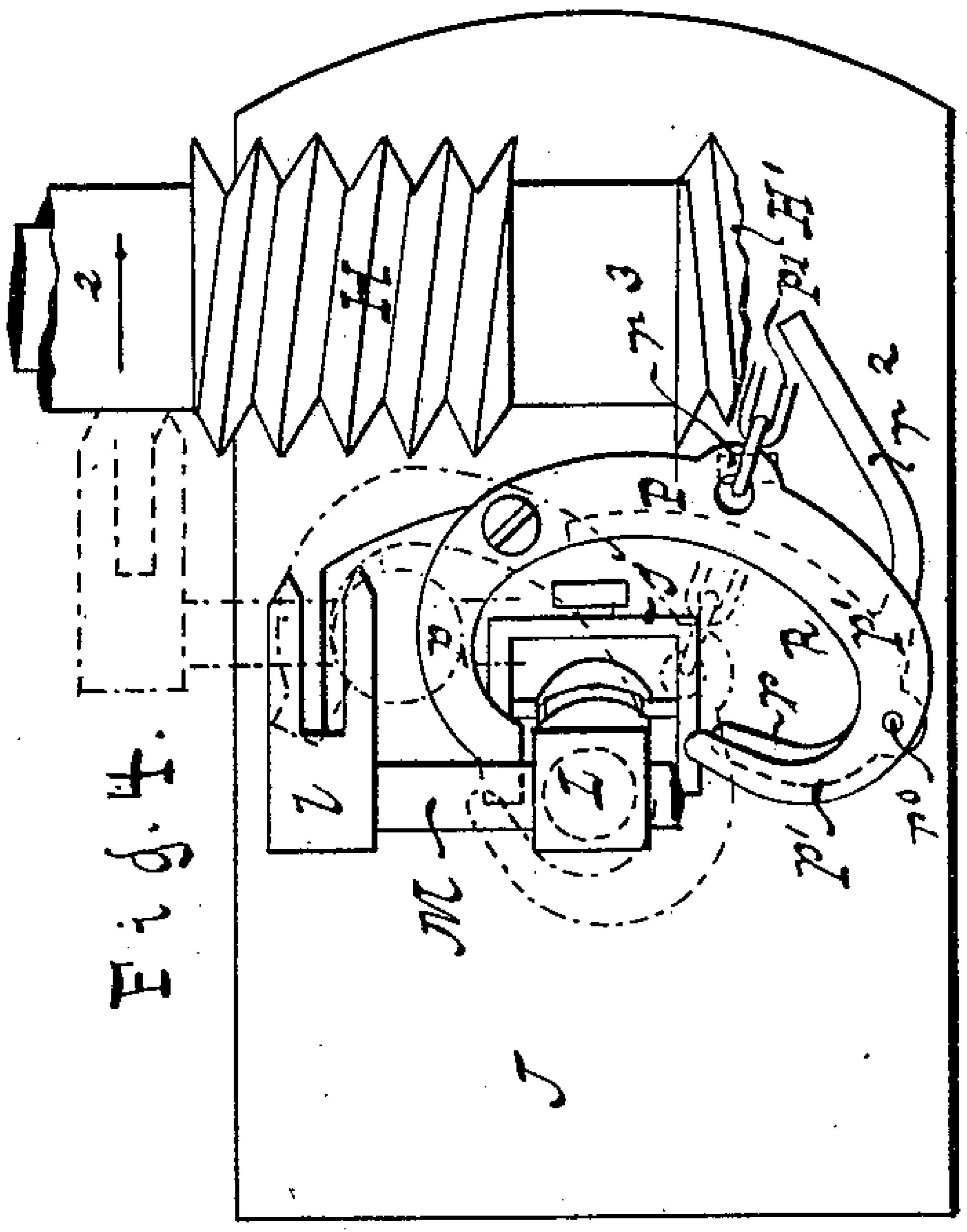


Fig. 5.

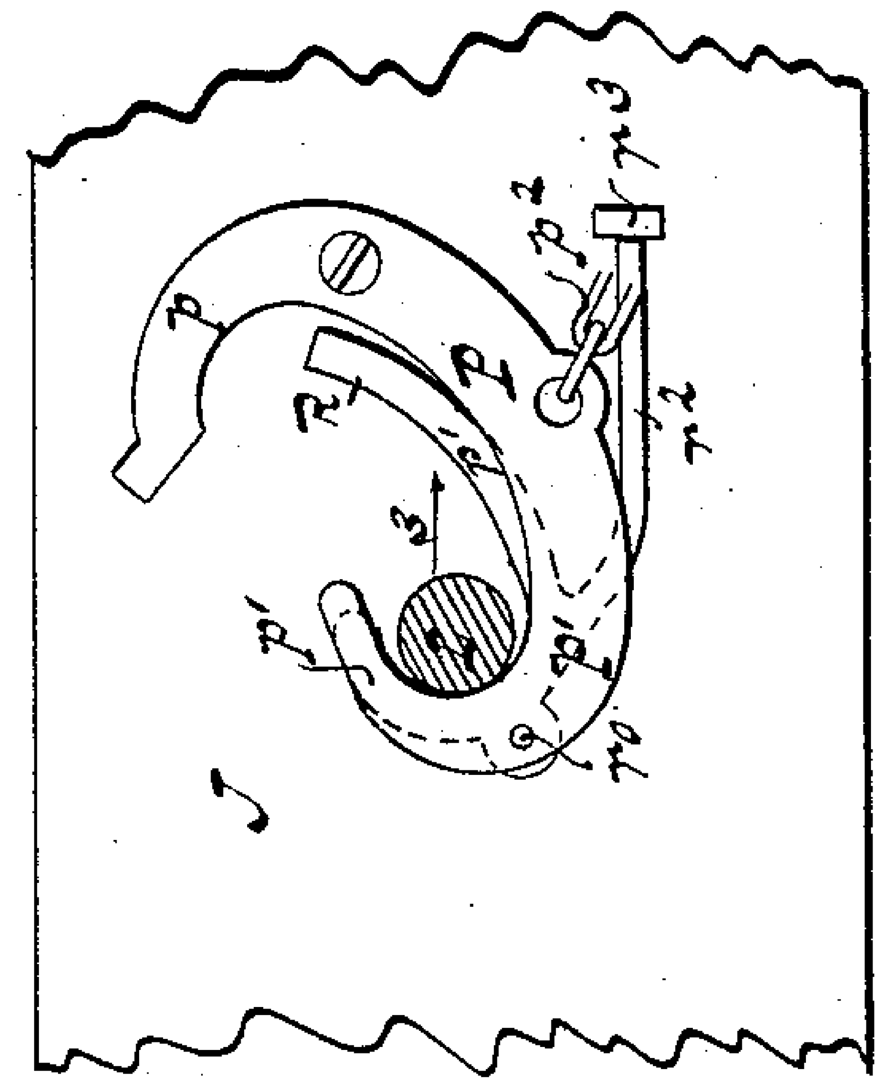
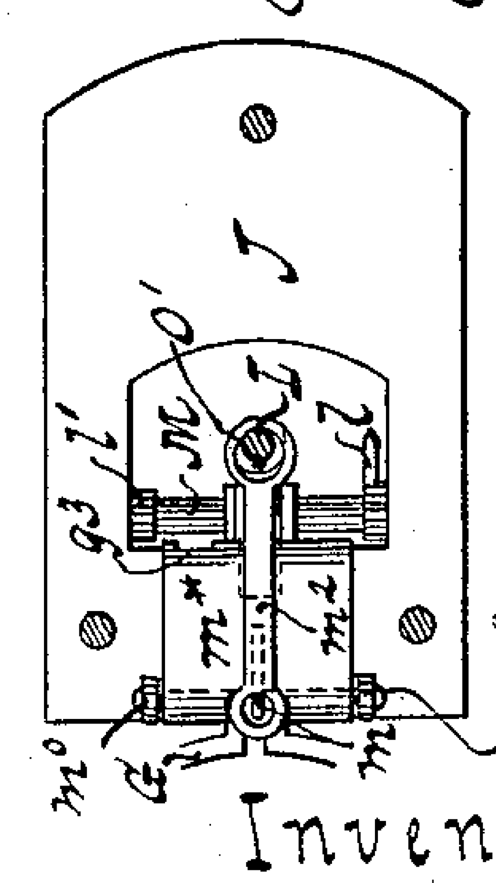


Fig. 3.



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(No Model.) 3 Sheets—Sheet 3.

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Fig. 8.

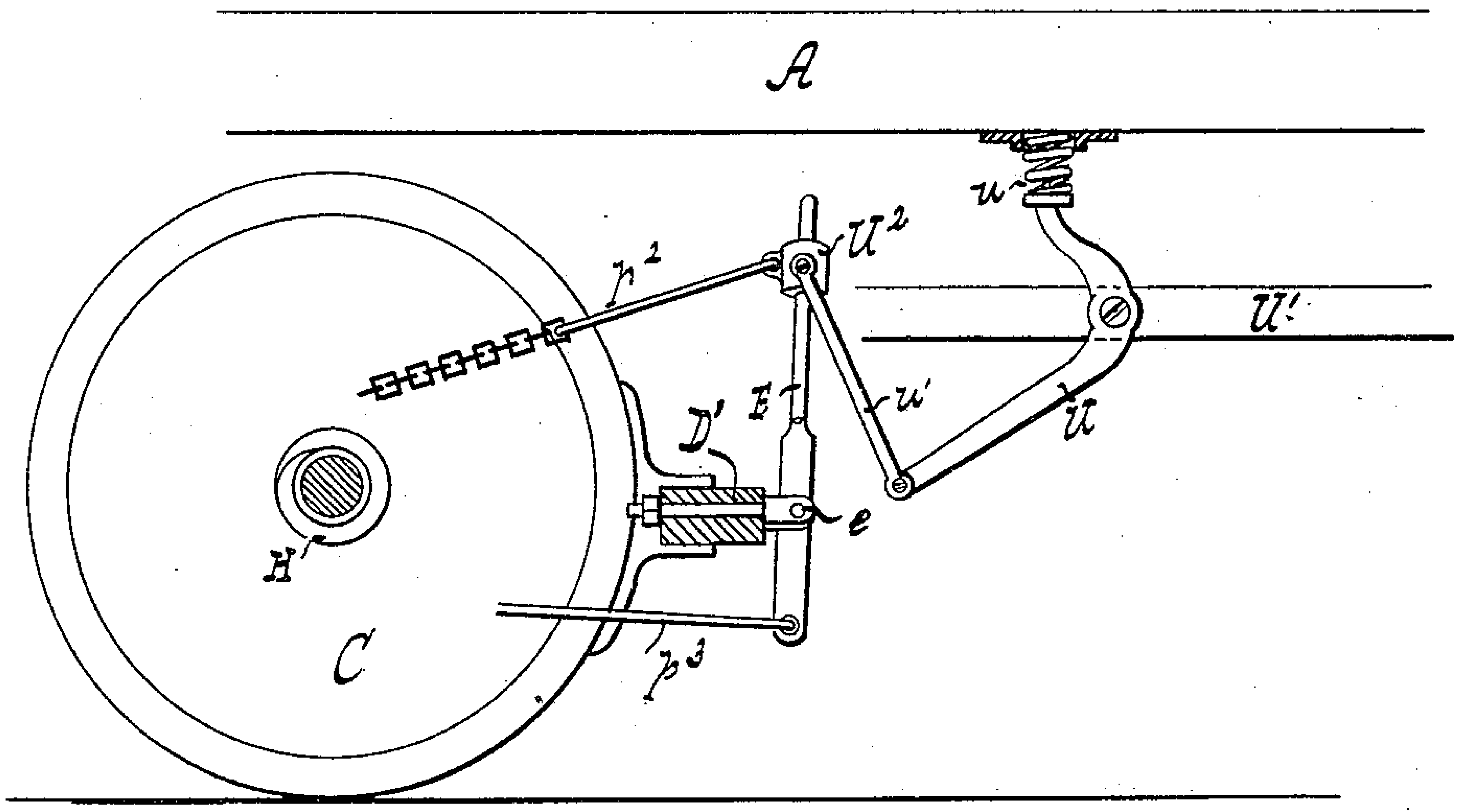


Fig. 6.

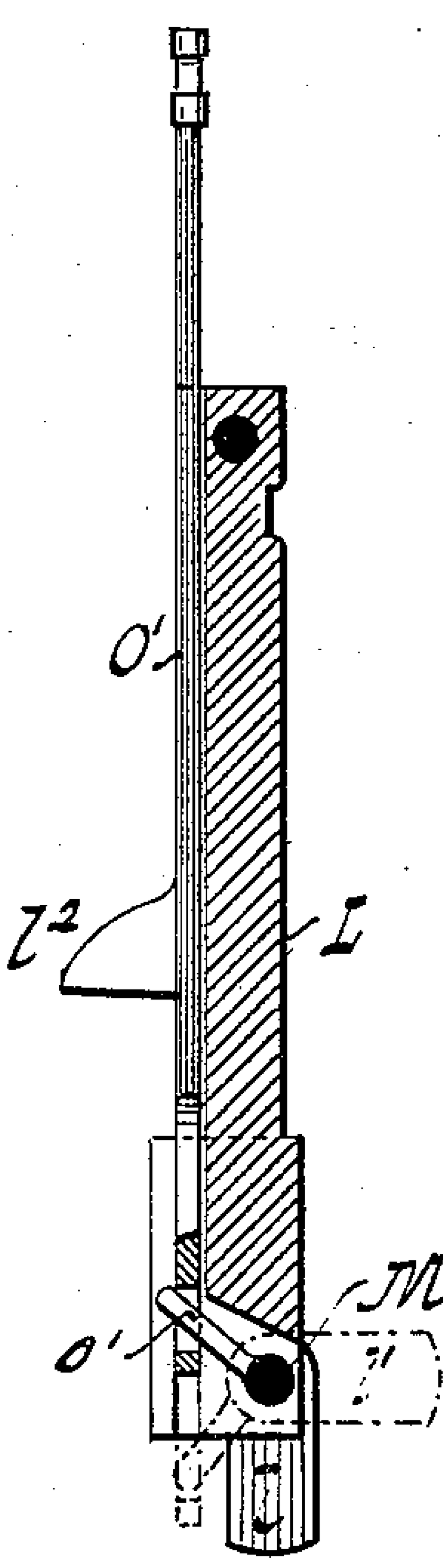
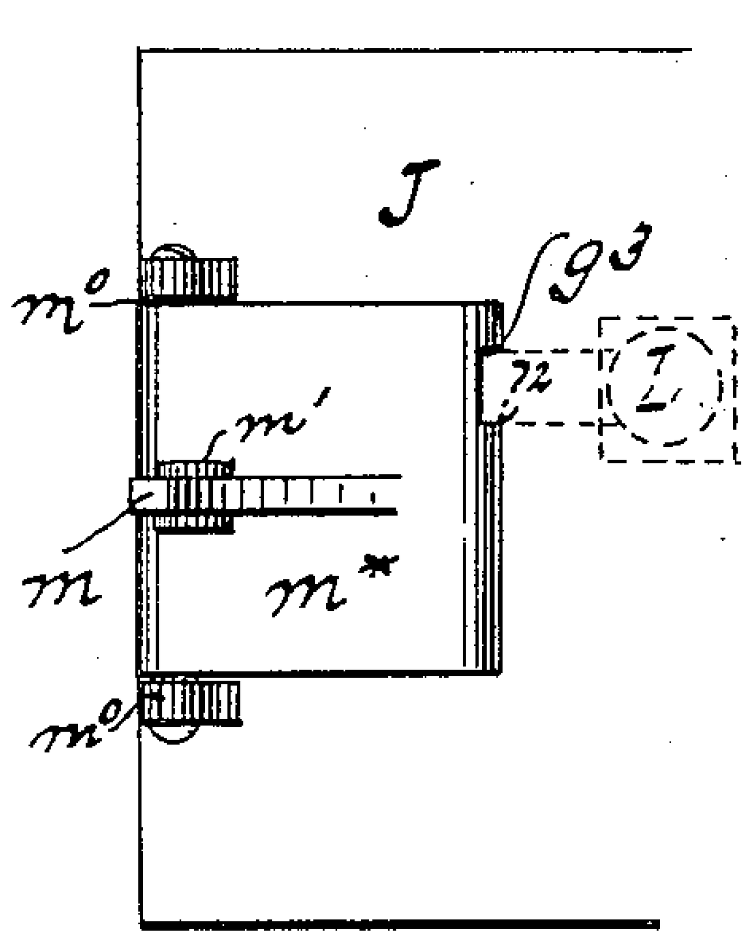


Fig. 7.



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UNITED STATES PATENT OFFICE.

SAMUEL H. TERRY, OF BROOKLYN, NEW YORK.

CAR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 345,263, dated July 6, 1886.

Application filed October 29, 1885. Serial No. 181,293. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL H. TERRY, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented new and useful Improvements in Car-Brakes, of which the following is a specification.

My invention relates to improvements in mechanism for operating car-brakes; and the object of this invention is to provide car-brake mechanism which shall be entirely automatic, and which will operate to apply the brakes irrespective of the direction of motion of the train. The brake mechanism is connected with and operated by the draw-bars, so that when the brakes are applied to the engine, or when the engine is reversed, the momentum of each car will furnish sufficient pressure at its draw-bar to operate the brake.

The invention consists, essentially, in the combination, with the draw-bar of a car and with a right and left hand screw-thread carried by one of the axles, of a toothed arm suspended from the car-body, which arm is connected with and operated by the draw-head, and serves to apply the brakes. A pivoted yoke-lever connected with the brakes is engaged and moved about its pivot by the toothed arm, whereby the brakes are applied. To adapt the brake for either direction of motion of the car, the teeth of the pendent arm are mounted at right angles to each other on the opposite ends of a rock-shaft having bearings in the arm, and said rock-shaft is turned at the proper time by suitable lever-connections with the draw-heads, so that when the car is drawn in one direction one of the teeth is in a position to engage with one of the screws, and when the engine is placed at the other end of the train the second tooth is in position to engage the remaining screw, said operation being effected by the drawing outward of the draw-bars, while the application of the brakes is effected by the inward motion of the said draw-bars. Mechanism is also employed whereby the power with which the brakes are applied is regulated according to the load on the car.

The above-mentioned novel features, together with other distinguishing features, are more fully pointed out in the following specification and claims, and illustrated in the accompanying drawings, in which—

Figure 1 represents an inverted plan view of a car provided with my improved brake mechanism. Fig. 2 is a vertical longitudinal section thereof in the plane *y y*, Fig. 1. Fig. 3 is a horizontal section in the plane *x x*, Fig. 2. Fig. 4 is an inverted plan view, on a larger scale than the preceding figures, of the arm and the yoked lever. Fig. 5 is a similar sectional view of the same, showing the parts in a different position. Fig. 6 is a longitudinal vertical section of the pendent arm on the same scale as Fig. 4. Fig. 7 is a plan view of detail parts. Fig. 8 is a side elevation of the mechanism for regulating the power with which the brakes are applied.

Similar letters indicate corresponding parts.

In the drawings, the letter A designates the car-platform; B, one of the trucks. C are the truck-wheels; D D′, the brake-bars, all of ordinary construction.

E is the brake-lever, and F is one of the draw-bars. The draw-bar F, which works through suitable guides or boxes, is provided with a draw-head, which is normally extended out from the car by means of a spring, *f*, which acts against a collar or stop, *f′*, Fig. 2, on the draw-bar. A spring-cushion, f^2, is arranged upon the draw-bar in advance of said collar, in order to take up the shock in starting. To the rear end of the draw-head, and forming an extension thereof, is attached a bar, G, which is made yoke-shaped, so as to surround and clear the truck king-bolt, and thereby allow the said bar to freely move longitudinally. Upon one of the axles of the truck is arranged a sleeve or collar having a left and right hand thread H H′ thereon, which threads are carried around the sleeve as many times as may be desired, the rapidity with which they act in causing the brakes to be applied being determined by their pitch. A suitable space is left between the terminals of these threads H H′, so as to distinctly separate the right and left hand portions of the screw and the intermediate hub thus left, and also the hubs left at both the outer ends of the threads are of greater diameter than that of the root of the thread, for a purpose hereinafter described.

J is a frame suspended from the platform, and to said frame is pivoted an arm, L, which can radially swing about its point of suspension both longitudinally and transversely, and said arm carries teeth $l\ l'$, each of which is adapted to engage with one of the threads H H′ on the axle. To swing the arm L toward the screw when the draw-bar is pushed in, a bell-crank lever, $m\ m^*$, is employed, Figs. 2, 3, and 7, which is pivoted at m° to the frame J, and one arm, m, of which is attached at m' to the bar G, previously described, while its other arm, m^*, acts upon a cam, l^2, projecting from the pendent arm L. To return the arm L to its normal position, a link, m^2, Fig. 2, is connected to the upwardly-extending arm m of the bell-crank lever $m\ m^*$, and to the arm L. To allow the pendent arm to swing freely in the two directions mentioned, it is pivoted to a box, j, which is journaled to lugs j' on the frame J, forming a gimbal. The teeth $l\ l'$ are rigidly secured to a rock-shaft, M, in such a position that when one tooth projects horizontally the other points vertically—that is to say, they are placed at right angles to each other and at such a distance apart that each would engage with the central thread of its respective threads on the axle; but only one of the same will engage with its respective thread at one time. As shown in the drawings, tooth l always engages thread H, which is left hand, and tooth l' engages thread H′, which is cut right hand. To vibrate this rock-shaft M, in order that the proper tooth may engage its respective thread at the proper time, I so connect the same with the two draw-bars of the car that when the locomotive is at one end of the train and starts forward in its motion the rock-shaft is vibrated, so as to bring one of the teeth in a horizontal position, while when the engine is at the other end of the car, the other tooth is brought into a horizontal position. To effect this, I employ a slide, N, Fig. 2, which is free to move longitudinally, and is connected with the draw-bars by rods N′ N′, each of which is secured to its draw-bar by a pin, n, playing in a slot, n', in the rod, while its other end extends through one end of the slide, and is subjected to the action of a spring, n^3. The slots n' in the rods N′ are so situated that the slide is only moved when either of the draw-bars is drawn outward. A slotted web, n^2, in the slide engages one arm of a bell-crank lever, O, pivoted to the frame J, the other arm of which lever O is provided with a fork, o, which engages one end of a rod, O′, which is guided in the arm L, and is connected with an extending arm, o', of the rock-shaft M. To lock this bell-crank lever O in a position corresponding to either ultimate position of the rock-shaft, a spring-latch, o^2, is employed, which engages the vertical arm of the said bell-crank lever O, but allows the same to vibrate and clear itself when the draw-head is sharply pulled.

To the lower plate of the frame J is pivoted a yoke-lever, P, the arms $p\ p'$ of which are in position to be engaged by the pendent arm L, and the arm p' of said yoke-lever is attached by a chain, p^2, to one arm of the brake-lever E, Figs. 1, 2, 4, and 5, which latter is pivoted at e to the brake-bar D′, so that when the yoke-lever P is turned in the proper direction about its pivot the brake-shoes are drawn against the wheels. The other arm of the brake-lever E has its connecting-rod p^3 carried forward and attached by suitable spring-connections with the opposite brake-bar, D, so that the lever will also operate the opposite brake-shoes. In order to prevent an undue pressure upon the pendent arm L, the bar G is not rigidly secured to the draw-bar; but a spring, g, is interposed between a shoulder on an extension of the same, against which spring a plate, g^2, projecting downward from the draw-bar F, abuts, and a spring-cushion, g', is placed on the opposite side of said plate. We will now suppose that the engine is at the forward end of the train, and the same is moving forward in the direction indicated by arrow 1, Fig. 2, and the axles rotate in the direction of arrow 2, Figs. 1 and 2. If, now, the brakes on the locomotive are applied to produce a slight stoppage of the same, or if the engine be reversed or its forward motion checked in any other manner, the momentum of the cars will result in a pressure on the draw-bars, and the same will be pushed inward. The inward motion of the draw-bar throws the pendent arm L in the direction of the screws H H′ by the action of the bell-crank lever $m\ m^*$, and tooth l is brought into engagement with thread H, and the said arm is carried to one side until it clears the thread, whence it is in the position shown by dotted lines in Fig. 5. The arm L in this lateral motion engages the arm p of the yoke-lever P, and thereby swings the yoke-lever about its pivot to the position shown by dotted lines in Fig. 5, and, consequently, through the connection of this yoke-lever with the brake-bar, the brake-shoes are drawn against the wheels. The arm L when in this lateral position is forced into engagement with a recess, g^3, Fig. 7, in the arm m^* of the bell-crank lever $m\ m^*$ by the hub at the end of the thread, and is thereby fixed in this position. As soon as the locomotive starts ahead again, the sharp pull on the draw-head draws the same outward, and the pendent arm L and yoke-lever P are returned to their normal positions by the link m^2, and the brakes are withdrawn from the wheels. When the locomotive backs the train—that is to say, moves the same in the opposite direction to arrow 1—the draw-bar will be pushed inward, and the same tooth, l, will engage with the thread H; but since the direction of rotation of the screw is now opposite to that indicated by arrow 2, Fig. 2, the arm L is carried in the opposite direction and toward the central hub, and does not engage or move the yoke P, and the brakes are not affected. If the backward motion of the locomotive is now checked, the draw-bars F are drawn outward, owing to the momentum of the cars, and the arm L engages the arm p of the yoke-lever P and draws the latter about its pivot to the position shown in Fig. 4, and the brake-shoes are thereby applied to the wheels. When the engine again resumes its backing motion, the draw-head is again pushed inward, and the arm L releases the yoke-lever, whereby the brakes are withdrawn. To throw the strain off the arm L when the brakes are in engagement with the wheels, I use a yoke-shaped lock, R, Figs. 5 and 6, which is pivoted at r° to the yoke-lever P, and has two arms, $r\,r'$, and a tail, r^2, which is adapted to engage a stop, r^3, arranged on the frame J. In the normal position of the lock R (brakes off) the arm r^2 is flush with the body of the yoke-lever P, while the arm r' thereof projects inwardly beyond the arm p' of the yoke-lever P and the tail r^2 is out of contact with stop r^3. When the brakes are applied during backing, the arm L engages the arm p' of the yoke-lever P and swings said lever around. The locking-lever R is also carried therewith, and the tail r^2 engages the stop r^3 and holds the yoke-shaped lever P in the position shown in Fig. 4. When the locomotive backs again, the arm L is thrown in the direction of arrow 4 and strikes arm of the lock, which now projects beyond the body of the yoke-lever P, and clears the tail r^2 from the stop r^3, so that the yoke-lever P can return to its normal position. Suppose, now, that the brakes are off, and the mechanism in its normal position, and the locomotive is at the other end of the train, opposite to arrow 1. The first forward movement of the locomotive causes the draw-bar at this end of the car to move outward, and the slide N is moved in the direction indicated by arrow 1, marked thereon in Fig. 2, and the bell-crank lever O is moved about its pivot to throw downward the rod O′, so as to turn the rock-shaft M, Fig. 6, in the proper direction to bring tooth l' in a horizontal position. If the motion of the locomotive is slackened, the draw-bar is pushed in, and the tooth l' of the arm L engages the right-hand thread, H′, of the screw, and the arm L is carried toward arm p of the yoke-lever P, and the brakes are applied in the same manner as when the brakes were applied when the car was moving forward in the opposite direction. The application of the brakes, when the train backs in this case, is precisely identical with that previously described. In case the coupling-link between two cars should break, or the cars should become separated in any manner, it is necessary that some connection should exist between the cars, which would apply the brakes in case of such an occurrence. For this purpose I pivot a lever, S, to the platform, one arm of which engages a pin, s, on a collar secured to the draw-head, while the other arm is attached to any convenient part of the car directly ahead by a connecting-rod, s', and chain. (Not shown.) The lever S bears on a hanger, S′, suspended from the car-bottom, and when the lever is swung so as throw on the brakes by pushing in the draw-head, it engages with a notch or projection, s^2, in said hanger, and is retained in this position. If the cars become separated, the rod s' will turn the lever before breaking, and the brakes will be thrown on by the action of the proper screw on the pendent arm L, as before.

To operate the brakes by hand, I attach an additional brake-rod, T, to the upper end of the brake-lever E, and this can be connected with a band-wheel or other well-known device to effect the purpose. If desired, the pendent arm L can be operated directly by hand, which would fit the brake for service on locomotive-engines.

To cause the brake-shoes to be applied with a greater or less force with varying loads on the car-platform, I make use of the device illustrated in Fig. 8, which device is actuated by the deflection of the car-platform by the load thereon, and is intended to increase or decrease the leverage through which the force exerted by the yoke-lever P upon the brake-lever E acts, so that when the leverage is decreased by the action of the device, as it will be when the car is loaded, the brake-shoes are applied with more force to the wheels than when the car is unloaded. The device consists, essentially, in providing the lever E with a sliding sleeve, U^2, to which the chain p, leading from the yoke-lever P, is attached, instead of being secured directly to the brake-lever E, as before described. The slilding sleeve U^2 is actuated by a bent lever, U, which is pivoted to a beam, U′, extending between the truck-beams, to which latter it is secured in order that it may not be affected by the deflection of the car-platform. By this device the force with which the brakes are applied is increased with increasing loads, and decreased with decreasing loads, and my object in providing this brake-controlling device is that the brakes will never be applied with a force greater than is necessary to overcome the momentum due to the load. One arm of the lever is attached by a suitable spring-connection, u, with the car-platform, while its other end is connected by a link, u', with a sleeve, U^2, which can slide on the brake-lever E, and to this sleeve U^2 the chain p^2, leading from the yoked lever P, is attached. With increasing loads on the car-platform the same will be depressed, and the sleeve will be caused to slide downward on the brake-lever, whereby the leverage on the arm extending upward from the pivot will be diminished, and a correspondingly greater force will be applied upon the brake-shoes, since the distance traversed by the arm p' will always be the same. With a decreasing load the effect will be the reverse, and consequently the pressure of the brake-shoes upon the wheels will always correspond to the load on the car-platform.

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

1. The combination, with the draw-bar of

a car and the axle, of the right and left hand screw on the axle and the toothed arm L, connected with and operated by the draw-bar, substantially as shown and described.

2. The combination, with the draw-bar and right and left hand screw on the axle, of the pendent toothed arm L, connected with and operated by the draw-bar, substantially as shown and described.

3. The combination, with the draw-bar of a car and the right and left hand screw carried by one of the axles, of the pendent toothed arm L, connected with the draw-head, and the yoke-lever P, connected with the brake-bars and in position to be engaged by the arm L, substantially as shown and described.

4. The combination, with the draw-bars of a car and the left and right hand screw carried by one of the axles, of the pendent arm L, the teeth l l', carried by said arm in the relative positions described, and the connections of the teeth with the draw-bars, substantially as shown and described.

5. The combination, with the draw-bar of a car and the axle carrying a right and left hand screw, of the toothed pendent arm L, the nose l^2 thereof, lever m m^*, link m^2, and bar G, for actuating arm L to engage the screw, substantially as shown and described.

6. The combination, with the pendent arm L, of the teeth l l', mounted on a rock-shaft, M, having bearings in the arm, the slide N, the slotted rods N′, connecting the slide with the draw-bars, and the bell-crank lever O, which is engaged by the slide and is in connection with an arm on the rock-shaft, substantially as shown and described.

7. The combination, with the draw-bar, the brake-bars, and the right and left hand screw carried by one of the axles, of the pendent arm connected with the draw-bar, the yoke-lever P, and the locking device R, substantially as shown and described.

8. The combination, with the brake-lever F and the yoke-lever P, of the sliding sleeve on the lever, connected with the yoke-lever P, and the lever connections of said sleeve with the car-platform, substantially as shown and described.

9. The combination, with the herein-described mechanism, of the sliding sleeve N^2 on the brake-lever, which is connected with the yoke-lever P, a bent lever, N, suitably pivoted, one arm of which is connected with the platform, the other arm being connected with the sleeve N^2, substantially as shown and described.

10. The combination, with the herein-described brake mechanism, of the lever S, pivoted to the platform and engaging the draw-head, the said lever being connected with the car in advance, and a stop or its equivalent, for holding the lever in its locking position, substantially as shown and described.

11. The combination, with the pendent lever L, of the teeth l l' thereof, connected with and operated by the draw-bars, substantially as shown and described.

12. The combination, with the pendent arm L, of the teeth l l', the herein-described mechanism for operating the same, and the spring-latch o^2, for locking said mechanism, substantially as shown and described.

13. The combination, with the yoke-lever P, the device for locking the yoke-lever, which consists of a bent lever, R, pivoted to the yoke-lever P, and having a tail adapted to engage with a stop, r^3, substantially as shown and described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

SAMUEL H. TERRY.

Witnesses:
W. HAUFF,
A. FABER DU FAUR, Jr.