No. 819,203. PATENTED MAY 1, 1906.

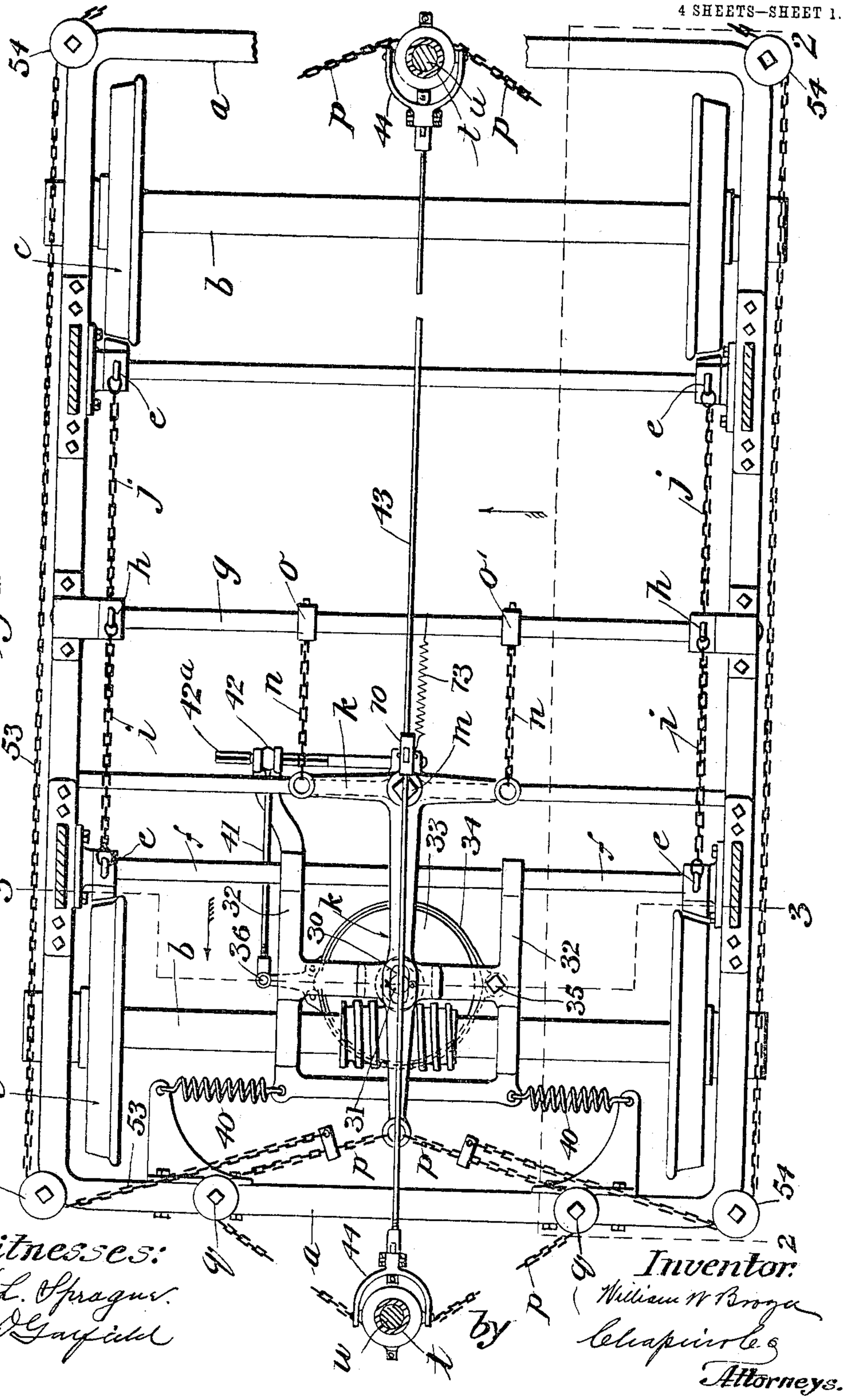
W. W. BROGA.

CAR BRAKE.

APPLICATION FILED FEB. 1, 1904. RENEWED SEPT. 23, 1904.

4 SHEETS—SHEET 1.

Fig. 1.



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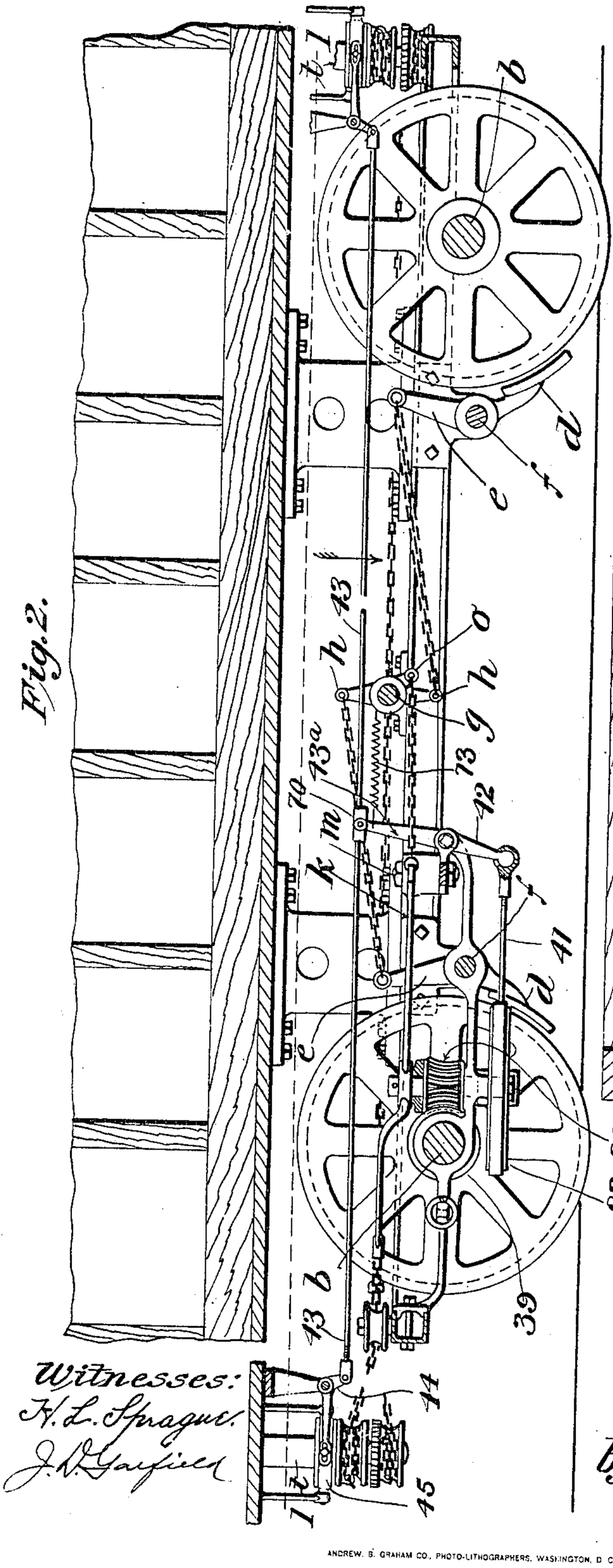
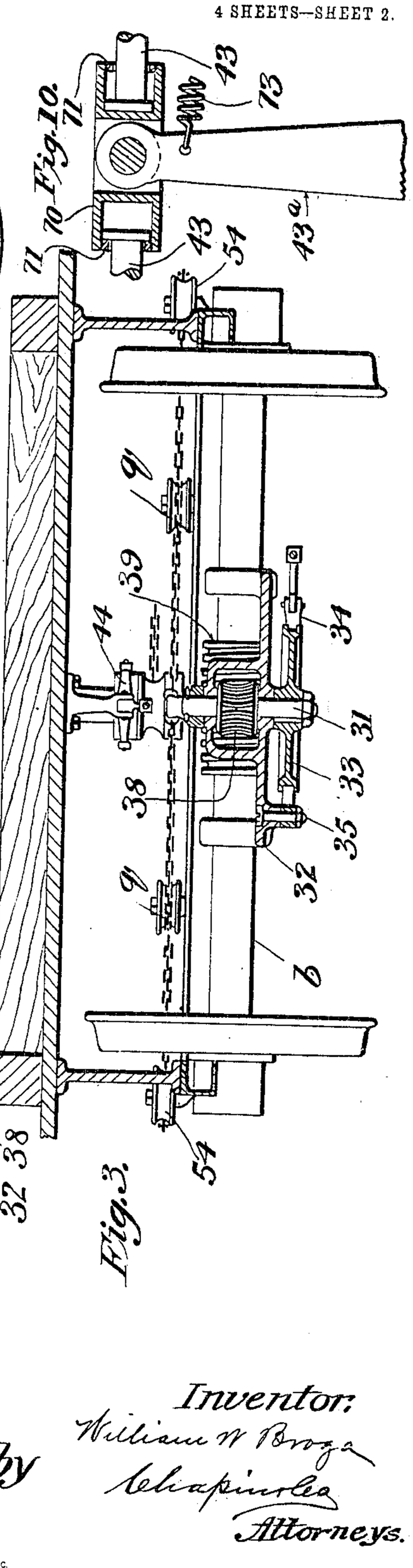
4 SHEETS—SHEET 2.





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4 SHEETS—SHEET 3.

Fig. 4.

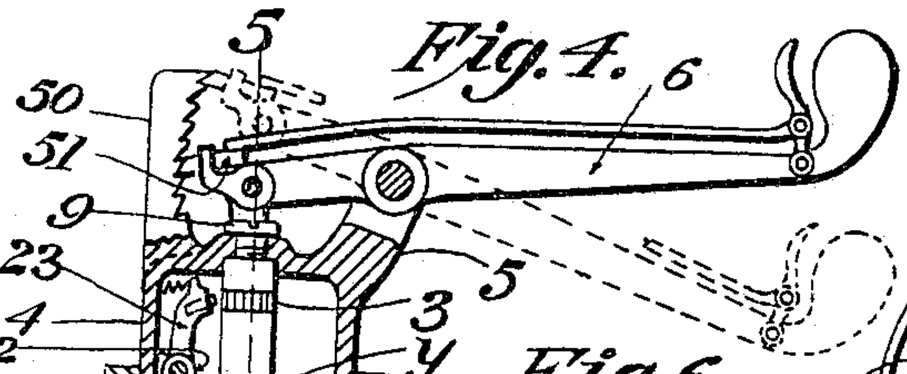


Fig. 5.

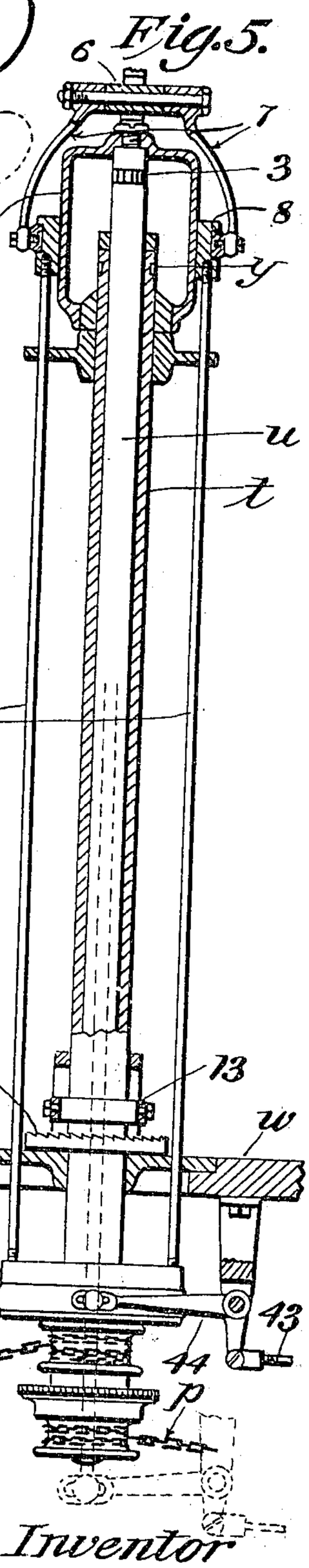


Fig. 7.

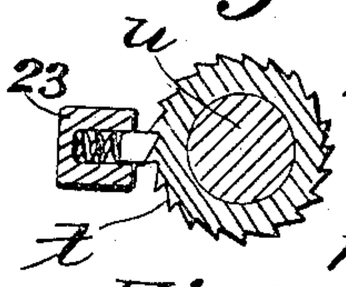


Fig. 6.

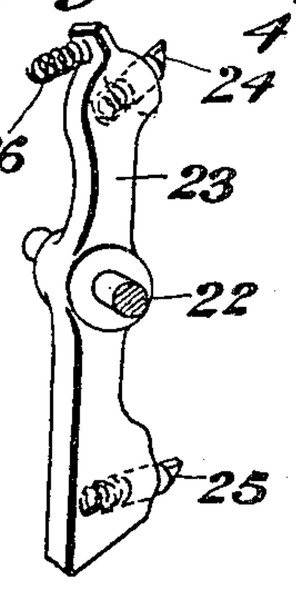
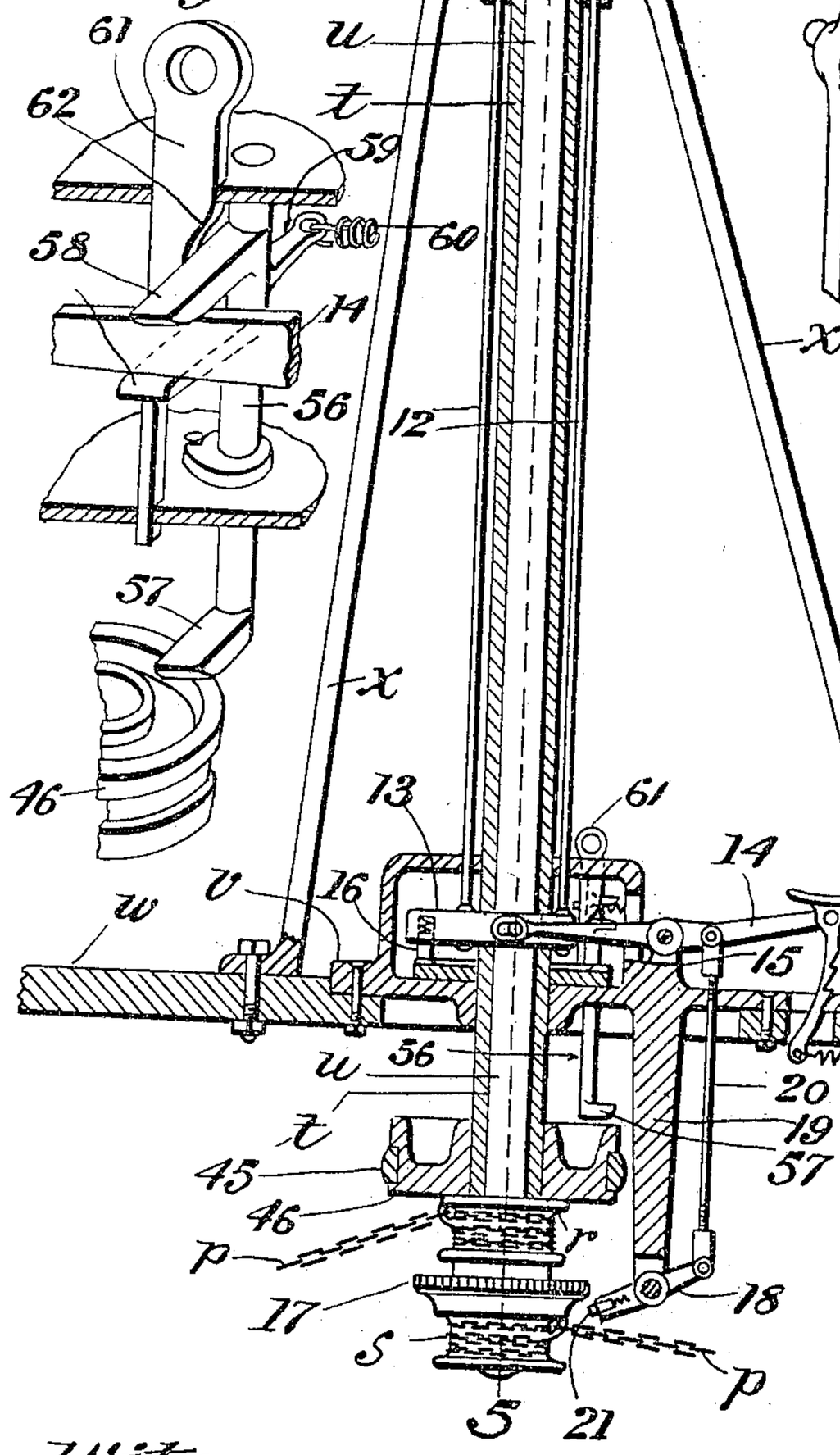


Fig. 11.



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4 SHEETS—SHEET 4.

Fig. 8.

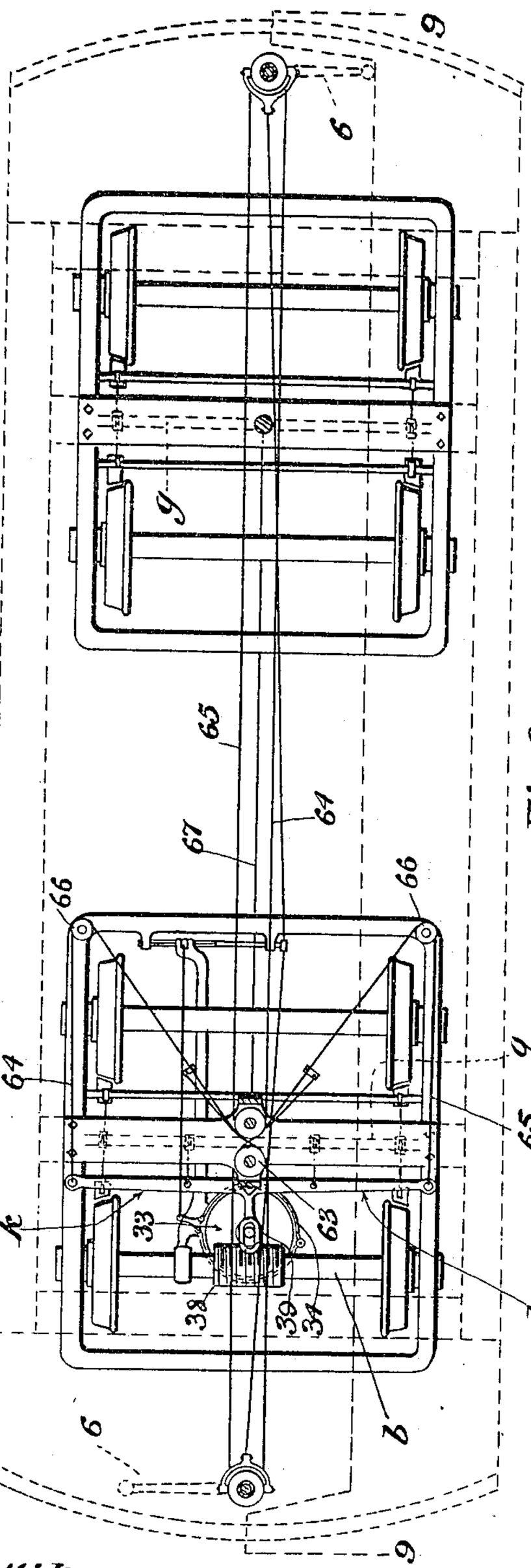
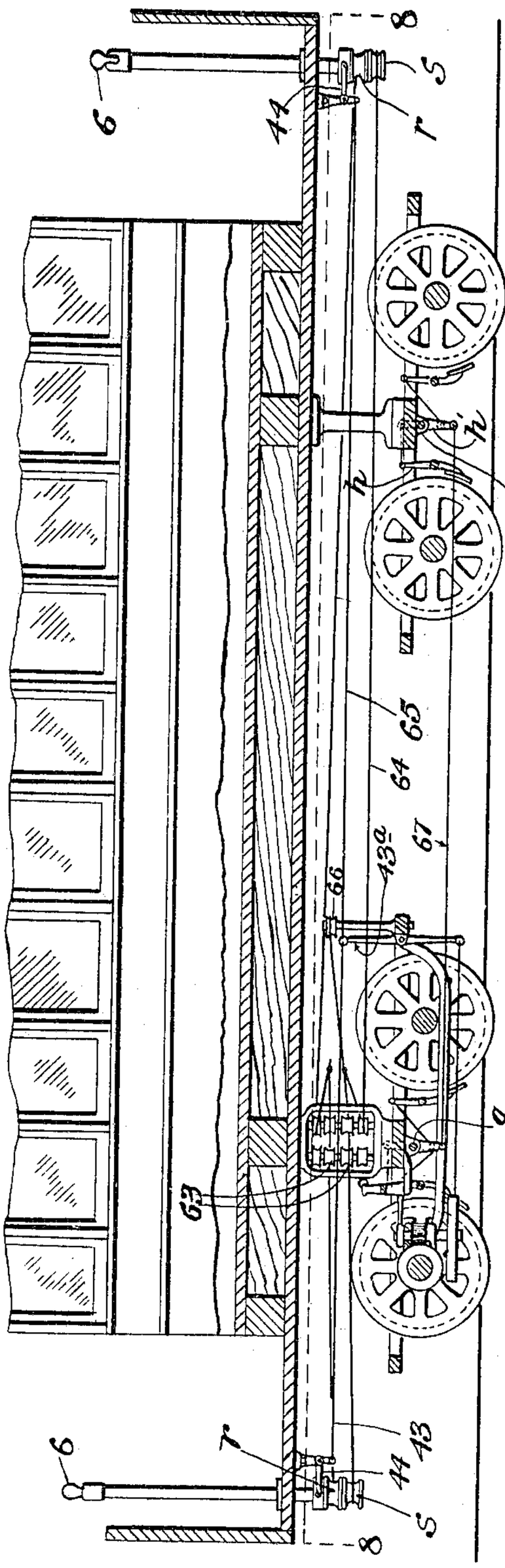


Fig. 9.



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UNITED STATES PATENT OFFICE.

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CAR-BRAKE.

No. 819,203. Specification of Letters Patent. Patented May 1, 1906.

Application filed February 1, 1904. Renewed September 23, 1904. Serial No. 225,613.

To all whom it may concern:

Be it known that I, WILLIAM W. BROGA, a citizen of the United States of America, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Car-Brakes, of which the following is a specification.

This invention relates to car-brakes, the object thereof being to provide a brake construction which may be operated by hand in the usual manner and having associated therewith novel devices whereby the momentum of the car may be employed to supply the power required to set the brake more firmly than it can be done by hand.

A further object of the invention is to so arrange this construction that the momentum of the car alone can be used to set the brake, as well as employing this momentum in connection with hand-power.

A still further object of the invention lies in the provision of means whereby as much or as little of the energy resulting from the momentum of the car may be employed to set the brake in conjunction with hand-power or not, as desired.

The invention further embraces a construction whereby the brake may be operated from either end of the car, and it likewise embraces a construction whereby it may be used on a single or double truck car, as desired.

Having these ends in view the invention consists in the construction set forth in the following specification and clearly summarized in the claims appended thereto and clearly illustrated in the drawings accompanying this application, in which—

Figure 1 is a plan view of a car-truck of the type generally in use on the so-called "single-truck" cars, the brake-post being shown in section. Fig. 2 is a sectional elevation taken on line 2 2 of Fig. 1. Fig. 3 is a transverse section through Fig. 1 on line 3 3. Fig. 4 is a sectional elevation of the brake-post; and Fig. 5 is another sectional elevation of the brake-post, taken at right angles to the section in Fig. 4 in the plane of line 5 5 thereon, a part of the lower end of the post being shown in full lines. Fig. 6 is a perspective view of a pawl-arm located in the upper end of the brake-post shown much enlarged, Figs. 4 and 5 being also somewhat enlarged as compared with Fig. 1. Fig. 7 is a cross-section on line 7 7, Fig. 4. Fig. 8 is a plan view of the trucks of a double-truck car, showing the connections whereby the brakes may be set on both trucks from either end of the car. Fig. 9 is a sectional elevation of Fig. 8 on line 9 9 of the last-named figure. Fig. 10 is an enlarged view of a sliding connection which unites two parts of the main brake-operating rod. Fig. 11 is a perspective view of a device to lock one of the brake-posts in inoperative position.

In this application the brake mechanism is shown as applied to single and double truck cars, and while the mechanism in its general features is the same in both cases the arrangement of the brake connections differs somewhat, and that arrangement thereof relating to the single-truck cars will be first described, the same being illustrated in Figs. 1, 2, and 3. The brake-posts illustrated in Figs. 4 and 5 are of the same construction whether used in connection with the single or double truck.

Like characters of reference in all of the figures of the drawings, however, will be used to designate like parts.

a is a truck-frame in which are mounted in suitable bearings the axles *b*, all of the brake mechanisms excepting the brake-posts being mounted in the usual manner on the trucks. The wheels *c* of each of the axles on the single truck are provided with brake-shoes *d* of the ordinary construction, which are mounted on the arms *e*, the latter being secured to a shaft *f*, rotatably hung in the truck-frame *a*, that end of the arm *e* opposite that on which the brake-shoe *d* is secured projecting upwardly beyond the shaft *f*. Between the two shafts *f* is another shaft *g*, rotatably mounted in the truck-frame *a*, and secured to this shaft are arms *h*, one near each end thereof, extending above the shaft, and other arms *h'*, extending below the shaft, these arms extending from opposite sides of a common hub. From the arms *h* a suitable connection (preferably in the form of a chain *i*) extends to the arms *e* of one shaft, and from the arms *h'* other chains *j* extend to the arms *e* of the other shaft. Therefore if the shaft *g* be rotated the arms *h* and *h'*, swinging in opposite directions, will, through the medium of the chain connections *i* and *j*, swing the brake-arms *e*, thus throwing the shoes *d* on the lower end thereof into contact with the periphery of the wheels. To rotate the shaft *g*, a T-shaped lever *k* is pivotally supported on the frame at *m* to swing in a horizontal plane. The two short

arms of this lever lie transversely of the truck-frame parallel with the shaft *g* and with which the extremities of said arms are connected by chains *n* to depending arms *o* and *o'*, secured on said shaft *g*. The long arm of this lever *k* extends forward centrally of the two sides of the frame, and from its extremity two chains *p* extend in opposite directions around the sheaves *q* on the truck-frame, and from thence back toward the center thereof to two drums *r* and *s*, Figs. 4 and 5, on the brake-post.

The brake-post consists of two rotatable members, one the tubular member *t* and the other a post *u* within the latter, and the drum *r* is fixed on the end of the tubular member, and the drum *s* is fixed on the end of the post. These two members *t* and *u* extend through the casting *v*, which is let into the platform *w* of the car, and at a suitable distance above the latter they extend through a suitable support having legs *x* extending therefrom to the platform to rigidly hold these brake-operating members in vertical position. The upper end of the tubular member *t* is provided with ratchet-teeth *y*, extending thereabout, and the upper end of the post *u* is similarly provided with ratchet-teeth 3, the end of the post extending some distance above the end of the said tubular member. The upper extremities of said members are inclosed in a casing 4, on one side of the upper edge of which is a fork-arm 5, in which the crank-arm 6 is pivotally supported, the end of said arm, as shown in Fig. 5, which extends over the post, is by means of two side arms 7 connected with a ring let into the circumference of a sleeve 8, which slides loosely on the casing 4, the lower end of said casing resting on the support of the brake-operating members *u* and *t*. Centrally through the upper end of this casing is a screw or bolt 9, which enters the top of the post *u*, thus preventing any endwise movement of the casing.

Located just above the support of the brake-operating post is a collar 10, whose upper end is beveled, as shown in Figs. 4 and 5, and which has a sliding movement on the tubular member *t* and within the lower end of the casing 4, said collar being moved vertically by means of two rods 12, extending loosely down through said post-support to a ring 13, with which a treadle 14 is connected. Under this ring 13 is a circular ratchet-plate 15, concentric with the post *u* and fixed thereon, the ratchet-teeth thereon being on its upper surface, and in this ring 13 is a vertical pawl 16, whereby the treadle 14, pivoted on the casting *v*, thus holds the ring 13 against rotation. The tubular member *t* can only be rotated in one direction when the pawl 16 is in engagement with the ratchet-plate 15—that is to say, when it is desired to hold the drum *r* against rotation in one direction the treadle 14 may be operated in the manner described. To prevent the unwinding of the drum *s* in like manner, its edge is provided with ratchet-teeth 17, and the pawl-arm 18 is supported on a post 19, cast on the under side of the casting or plate *v*, a connecting-rod 20 extending from the treadle 14 down to said pawl-arm 18, whereby when the treadle is depressed and the pawl 16 released the pawl-arm 18 will be swung up into position to permit the pawl 21 in the end thereof to engage the ratchet-teeth 17. Both the pawls 16 and 21 are bevel-pointed, to the end that they may ride over the teeth of their respective ratchets when the chain is being wound onto either of the drums.

Reverting now to the casing 4 at the upper end of the brake-post, it is seen by reference to Fig. 4 of the drawings that a vertically-disposed arm is pivotally supported within said casing at 22. This arm is a pawl-arm, which is shown in Fig. 6 and is lettered 23. In the opposite ends thereof are located two pawls 24 and 25, which are designed to coöperate, respectively, the pawl 24 with the ratchet-teeth 3 and the pawl 25 with the ratchet-teeth *y*, a spring 26 being placed behind the upper end of this pawl-arm, tending normally to throw the pawl 25 into engagement with its ratchet-teeth *y* on the tubular member *t*. The lower end of this pawl-arm 23 is beveled to receive the beveled upper edge of the collar 10. Hence by operating the treadle 14 this collar may be moved upward to throw the pawl 24 into engagement with its ratchet-teeth 3, simultaneously releasing the pawl 16 from its ratchet-plate 15 and moving the pawl 21 into position of engagement with the ratchet-teeth 17, the latter being on the drum *s*, which is fixed to the post *u*. The pawl 24 will lock the casing 4 to the post *u*, and the crank-arm 6 on the casing will therefore rotate the post, the pawl 21 serving to hold the drum *s* against backward rotation. If, on the other hand, the collar 10 is depressed to the position shown in Fig. 4, then the spring 26 back of the pawl-arm 23 will throw the pawl 25 into engagement with the ratchet on the upper end of the tubular member *t*. Hence when the arm 6 is rotated the post *u* will be idle, and the tubular member *t* will rotate the drum *r*, and as the collar 10 cannot be moved downward far enough to establish this connection with the tubular member *t* without throwing the pawl 16 into engagement with the ratchet-plate 15 it is seen that the drum *r* will be prevented from unwinding any of the chain wound thereon by the rotation of this tubular member. Thus by the operation of the treadle 14 the arm 6 may be made to rotate at will clear of the drums *r* or *s*.

The foot-plate of the treadle 14 is pivotally mounted on the end of the latter and is provided with a depending arm 28, having teeth cut thereon to engage with the edge of

the plate *v*, a suitable spring 29 being provided to hold said teeth in engagement with the plate. There are three notches or teeth in this arm 28, and when the treadle is depressed, so that the upper tooth is engaged, the post *u* may be rotated. When the middle tooth is engaged, neither the post *u* nor the tubular member *t* can be rotated by the arm 6, and when it is in engagement with the lower tooth, as shown in Fig. 4, the tubular member *t* alone may be rotated. If the brake were to be used as a hand-brake alone, obviously but one of these drums would be necessary; but the construction having in view the use of the momentum of the car as an accessory power for applying the brake both of the drums are required, as will presently appear from the description of the means employed in the use of the momentum of the car and its application to the brake.

Referring now again to Figs. 1 and 2, it will be seen that the brake-chains *p* lead to both drums from opposite sides of the end of the long arm of the lever *k*. In this lever there is a long slot 30, with which the end of a vertical shaft 31 engages. This shaft is supported on a carriage 32, consisting of a rectangular frame which has a sliding movement on the axle *b* and on the shaft *f*. On the lower end of this shaft, as shown more clearly in Fig. 3, is a drum 33, and encircling this drum is a strap 34, made preferably in two parts, one end of each of which is secured to a post 35 and the opposite free ends of which are separated and pivotally connected with a lever 36, which may be swung one way or the other in the plane of rotation of the drum to bind the straps 34 to the latter, thereby preventing the rotation of the drum either altogether or partially. On the shaft on which the drum is mounted there is fixed a worm-gear 38 in mesh with a worm 39 on the axle *b*. Obviously, therefore, as long as the drum 33 is free to rotate the carriage 32 will remain stationary; but if the rotation of the drum be retarded then the carriage will move in one direction if the car is moving forward and in the opposite direction if the car is moving backward, and such movement of the carriage will by reason of the connection of the vertical shaft 31 with the arm of the lever *k*, above described, swing the arm on its axis *m* and in whichever direction the carriage moves will result in rocking the shaft *g*, whereby the brakes will be applied to the wheels of the car in the manner described. Two springs 40 are located between the carriage 32 and the truck-frame, extending toward the latter in opposite directions, which operate to return the carriage to a position centrally of the truck whenever it has been moved in either direction.

We now come to the means employed for tightening the straps 34 around the drum 33. This is clearly shown in Figs. 1 and 2, and it consists in a rigid connection 41, extending from the end of the lever 36 to the lower end of an arm 42 on one end of a shaft 42^a, a similar upwardly-extending arm 43^a on the other end of the shaft, with the upper end of which a rod 43 engages, which extends longitudinally of the truck to the brake-posts at opposite ends thereof. Near each of said brake-posts is mounted an elbow-lever 44, which swings on a horizontal axis, one arm of said lever being engaged by the rod 43, the other end engaging a circular strap 45, let into the circumference of a disk 46, loosely mounted on the lower end of the tubular member *t*, all of which may be clearly followed in Figs. 4 and 5. From opposite sides of this disk 46 two rods 47 extend upward into the sleeve 8, which surrounds the casing 4, and with which sleeve the end of the crank-arm 6 is connected by the arms 7, this connection being of such a nature as to permit the rotation of the arm without imparting rotary movements to the sleeve 8; but when the end of the crank-arm 6 is moved in a vertical plane then the sleeve will be given like movement, which through the connections described will be imparted to the rod 43, thus constricting the drum and imparting movements to the carriage. It will be observed that the arm 42 is located on the squared end of the shaft 42^a and that the hub of this arm is engaged by the forked end of an extension of one side of the carriage 32, to the end that whichever way the carriage may travel the shaft 42^a may be at all times rotated by means of the rod 43 to actuate the straps 34 in the manner described.

Referring back now to Fig. 4, it is seen that on the casing 4 a post 50 extends upwardly from the top thereof and is provided on its inner edge with ratchet-teeth, said edge being curved to conform to the radius of the inner end of the crank-arm 6, the latter being provided with a pawl 51, which may be operated from the handle end of the crank-arm, but which is normally spring-pressed toward the ratchet. This post 50 being on the casing 4, it will always maintain its position relative to the end of the crank-arm 6, and the latter may, therefore, at any time have the handle end thereof depressed, and thus retard the rotation of the drum 33, whereby the carriage 32 will move sidewise and the momentum of the car thus be employed to set the brakes more tightly than would be possible by hand-power applied to the crank-arm 6.

It is clear from the foregoing description that if for any reason a car should start to run downhill backward the rotation of the worm-gear would be reversed, and if there were but one drum, as *s*, on the brake-post and the carriage 32 could thus only be moved in one direction by hand-power the reversal of the direction of movement of the car

would render the parts inoperative if it were desired to take advantage of the momentum of the car to set the brake, for the reason that the rotation of the worm would be in a direction contrary to that required to insure its coöperation with the hand-brake. Therefore by means of the treadle 14 either one of the drums *r* or *s* may be employed to set the brake by hand, according as the direction of the car is forward or backward, and when at the end of the route the operator of the car desires to shift his position from one end to the other then the treadle 14 may be depressed to engage the middle notch on the arm under the foot-plate with the plate *v* and thus render idle both the tubular member *t* and the post *u*, whereby either one of them may be free to pay off more or less of the chain wound thereon in response to movements imparted to the brake mechanism from the opposite end of the car.

From the foregoing description it is obvious that the crank-arm 6 may be used to set the brake manually either by the complete rotation thereof or by the use of the ratchets and a partial rotation of the handle, and when the brake is sufficiently set by hand the operator may, by moving it vertically more or less, establish a slipping clutch engagement between the drum 33 and the straps 34, and thus apply as much or as little of the stored energy in the momentum of the car to still further apply the brake.

For the purpose of making the brake operative from either end of the car a chain 53 is secured on each side of the central line of the truck to the chain *p* and extending around sheaves 54 on the corners of the truck runs to the chain *p* at the opposite end, to which it is attached by a clamp in a similar manner. Thus all movements of one of the brake-posts will be imparted to the other, it being assumed that the tubular member *t* and post *u* will be adjusted to rotate freely in the manner described when not in use.

It is obvious that, if desired, the rod 43 and its elbow-lever 44 (shown in Fig. 5) could be dropped to the position shown in dotted lines and the elbow-lever be operated by a rod extending up through the post *u*, as indicated in said figure also in dotted lines, said rod having a suitable connection with the crank-arms 6. This change (which is merely a change in the construction of the mechanism whereby the elbow-lever 44 is operated) would certainly fall within the scope of this invention, as would also other similar changes which are changes of form only in the mechanism whereby certain operations are carried out. For example, instead of providing the brake-post with the two drums *r* and *s* and associating therewith means whereby either one or the other may be rotated it would be possible to have both of the drums fixed on a single tier of posts and rotate the posts in one direction to wind up the chain on one of the drums and in the opposite direction to wind up the chain on the other. The construction shown and described herein, however, is the preferred construction.

When the treadle 14 is depressed so as to bring the middle notch on the arm 28 in engagement with the edge of the plate *v*, it is necessary to the proper operation of the brake mechanism from the opposite end of the car that this adjustment should not be disturbed. To prevent this, means (illustrated in Fig. 11 of the drawings) are provided whereby the treadle may be locked in the desired position, said parts being operable only when the treadle is supported on the middle notch of the arm 28. The mechanism for this purpose consists of a rotatable post 56, suitably supported in the plate *v* in a position parallel to the brake-post, having on the lower end thereof a rectangular projection or foot 57, located in proximity to the upper edge of the circular member 46, whereby when the post 56 is rotated this foot may swing over the edge of said circular plate, thereby rendering it impossible by operating the crank-arm 6 above to slide the disk 46 upwardly in the manner heretofore described. On the post 56 and in the same vertical plane as the foot 57 the fork-arms 58 are located, which are arranged to swing around and engage the treadle 14 at the same moment the foot 57 swings over the upper edge of the disk 46, thereby locking the treadle and said disk simultaneously against vertical movements. This post 56 is constructed with an arm 59 projecting rectangularly therefrom, to which a spring 60 is attached, whereby if the post is left free to rotate the spring will operate to rotate and engage the treadle and said circular member in the manner described. To rotate the post in the opposite direction, a wedge-shaped pin or bar 61 is fitted into suitably-arranged slots in the plate *v*, made to receive it, all clearly shown in said Fig. 11. When this bar is forced down, the wedge-shaped edge 62 thereof will bear against the side of the arms 58 and rotate the post 56 to throw said arms out of engagement with the treadle 14 and the foot 57 out of engagement with the disk 46. This bar 61 is carried by the operator of the car, and whenever he leaves one end of the car to go to the other he pulls out the bar after having set the treadle on the middle notch of the arm 28, and the post 56 will then be swung around in the manner described, effecting the locking of the brake-posts and treadle in inoperative position. When the device is left thus, the insertion of the bar 61 in the manner described will swing the post in the manner described and release the treadle and the disk 46. The bar 61 will thus serve for both ends of the car.

The application of this brake mechanism

to the double-truck car will now be described, the difference in the two constructions consisting, however, only in a rearrangement of the connections between the brake mechanisms and the brake-posts for the purpose of accommodating these constructions to trucks which swivel. This being the case all the connections must lead to or near the axis of the trucks. This arrangement, however, may be followed on the plan view of the under side of the trucks shown in Fig. 8 and in the sectional elevation shown in Fig. 9. In this arrangement the sheaves *q*, Fig. 1, are eliminated and the chains wound, respectively, around the drums *r* and *s* (which bear the same letters of reference) lead back directly to sheaves 63, Figs. 8 and 9, arranged on a common vertical axis. the chain from the drum *s* being indicated by 64 and the chain from the drum *r* being indicated by 65. These chains pass around opposite sides of their respective sheaves and lead diagonally across to the rear end of the truck to sheaves 66 and from thence back again toward the forward end to the T-lever *k*, which has the same function as the same lever *k* shown in Fig. 1, with the exception that one end of said lever does not project beyond the pivotal point of the drum 33. This drum, the worm-gear, and the worm on the axle *b* are all constructed in the same manner as shown in Fig. 1, the form of the carriage being different, and the difference in the manner of actuating the lever *k* consists merely in extending the two arms thereof parallel with the axle out to the sides of the truck and connecting the chains 64 and 65 thereto, whereby precisely the same action on the brakes is attained as in the construction shown in Fig. 1, where this lever *k* is actuated by carrying the end of it forward and the chains *p* around the sheaves *q* from said end to the drums *r* and *s*. When the lever *k* is swung by the chains 64 and 65, the rock-shaft under the truck (which corresponds in its function to the rock-shaft *g* in Fig. 2 and is therefore similarly indicated herein) is rotated, and by the oppositely-disposed vertical arms *h* and *h'*, having the same function as these arms on the shaft *g*, the brake-shoes are applied to the wheel.

The foregoing description applies to the connection located on the left-hand truck of Figs. 8 and 9, and to actuate the brake-shoes on the truck at the other end of the car another chain or rod 67 extends from an arm centrally located on the shaft *g* on the first-described truck to a similarly-depending arm on another rock-shatt *g* under the other truck, which serves to effect the rotation or oscillation of this second rock-shaft simultaneously with the oscillation of the first-described rock-shaft. When, however, it is desired to employ the momentum of the cars as an auxiliary braking power, the crank-arm 6 will be depressed in the usual manner to operate the elbow-lever 44 from which the rod 43 extends to the upper end of the arm 43^a, a similar connection extending thereto from the elbow-lever 44 at the other end of the car. This arm 43^a, if swung on its axis by means of these connections in either direction longitudinally of the car, will tighten the straps 34 about the drum 33, and therefore connect operatively the worm-gear 38 and the worm 39, bringing into play the power stored in the momentum of the car and applying it to the brakes. It will be observed that the connection 43, extending from the arm 43^a in opposite directions to the brake-posts, is practically a rigid connection consisting of two rods. It is therefore obvious that there must be at some point provision made for some lost motion, for when the crank-arm 6, for example, at the left-hand end of the car (as represented in Figs. 8 and 9) is depressed it will pull the connection 43 to effect the tightening of the straps around the drum 33, and that when the crank-arm 6 at the opposite end of the car is operated it would manifestly do the same. Therefore, as shown in Fig. 10, the ends of the rods 43 are mounted in a sleeve 70, pivotally hung on the end of the arm 43^a, each of said connecting-rods 43 entering said sleeve from opposite ends and being each provided with a head thereon playing within the sleeve, which head when the connection 43 is pulled toward the brake-post comes in contact with an internal flange or ring 71 and actuates the arm 43^a without imparting movement to the other connection 43. For example, if the rod 43 in the left-hand end of the sleeve 70 be drawn to the left it will swing the arm 43^a without moving the other end of the connecting-rod 43 in the opposite end of the sleeve, and when by the release of the crank-arm 6 the straps 34 are loosened the spring 73 will draw the arm 43^a back to normal position.

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

1. In a car-brake of the class described, an axle and a worm thereon, a frame slidably supported on the truck of the car, a drum supported on the frame, and constricting means encircling the drum; a lever pivotally supported on the truck, a rock-shaft to operate the brake-shoes in the usual manner, and a connection between one end of said lever and an arm on the shaft, the opposite end of the lever being connected with said frame; a worm-gear on the axis of the drum in mesh with the worm on the axle; means to tighten the constricting means about the drum more or less, to impart movement to the frame to effect the rotation of the rock-shaft, whereby the brakes may be set.

2. In a car-brake of the class described, an axle and a worm thereon, a frame slidably supported on the truck of the car to move in

opposite directions transversely thereof, a drum rotatably supported in the frame, a worm-gear on the axis of the drum in mesh with the worm on the shaft, a lever pivoted on the truck having oppositely-extending arms, connections from said arms to a rock-shaft, a connection between said lever and said slidable frame whereby the movements of the latter in either direction may effect the oscillation of said rock-shaft, means extending to the platform of the car to apply frictional resistance to said drum whereby said frame may have imparted thereto more or less movement in opposition directions, together with means to return the frame to normal position upon the release of the drum.

3. In a car-brake of the class described, a car-axle and a worm fixed thereon, a frame supported to slide in opposite directions in parallelism with the axle, a worm-gear in mesh with said worm, said gear being supported in said frame and normally rotating idly therein, and means carried on the frame and operable from the platform of the car to resist more or less the rotation of said worm-gear, and a brake-operating lever pivotally supported on the truck of the car and having a suitable engagement with said frame, whereby the movement of the frame may operate the brake, together with manually-operated means to impart movement to the brake-operating lever independently of any movement imparted thereto by the rotation of the axle.

4. In a car-brake of the class described, a frame supported on the truck to slide in opposite directions, a brake-lever pivoted on the truck and having a connection with said frame whereby the sliding movements of the latter in either direction will operate to set the brakes; a brake-post on the platform of the car at each end thereof, manually-operated means extending from said posts to said brake-operating lever, to operate the brakes by hand in the usual manner, in combination with normally inoperative mechanism carried on said frame and connected with the axle of the car, whereby the rotation of the latter may operate to impart sliding movement to said frame independently of the hand operating means, together with connections extending from the frame to the platform of the car to effect the actuation of said mechanism at will.

5. In a car-brake, a suitable brake mechanism, momentum-operated brake-setting devices, suitable connections between said devices and the axle of the car to effect their operation, a brake-post, manually-actuated connections between said post and the brake mechanism, and separate means for operating the momentum-operated and manually-actuated connections jointly or independently.

6. The combination with a car-brake, of momentum-operated and manually-operated devices to set the brake; a brake-post located at either end of a car, and means on said posts to actuate said momentum or said manual brake-setting devices either independently or one in connection with the other.

7. The combination with a car-brake of momentum-operated and manually-operated devices to set the brake, of a brake-post, connections between said post and said momentum devices and manual devices, and means on said post common to both of said devices whereby the latter may be operated either singly or together.

8. The combination with a car-brake, of momentum-operated and manually-operated devices to set the brake; a brake-post located at either end of a car, and means on said posts to actuate said momentum or said manual brake-setting devices, either independently or one in connection with the other, together with means to render one of said brake-posts inoperative when the other is operated.

9. The combination with a car-brake of momentum-operated and manually-operated devices to set the brake, a brake-post consisting of two concentric rotatable members, a drum secured to each member, and a flexible connection extending from said drums to the brake-operating devices, a crank-arm, and means to connect the arm to either of said concentric post members, whereby one may be operated independently of the other to set the brake, together with means connected with said crank-arm to effect the actuation of the momentum-operated brake-setting devices.

10. In a car-brake, the combination with momentum-operated and manually-actuated devices to set the brake, of a brake-post, separate sets of connections respectively between said post and the momentum-operated and manually-actuated devices, and means common to both of said devices whereby the latter may be operated either singly or together.

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Witnesses:
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K. I. CLEMONS.