

No. 618,283.

Patented Jan. 24, 1899.

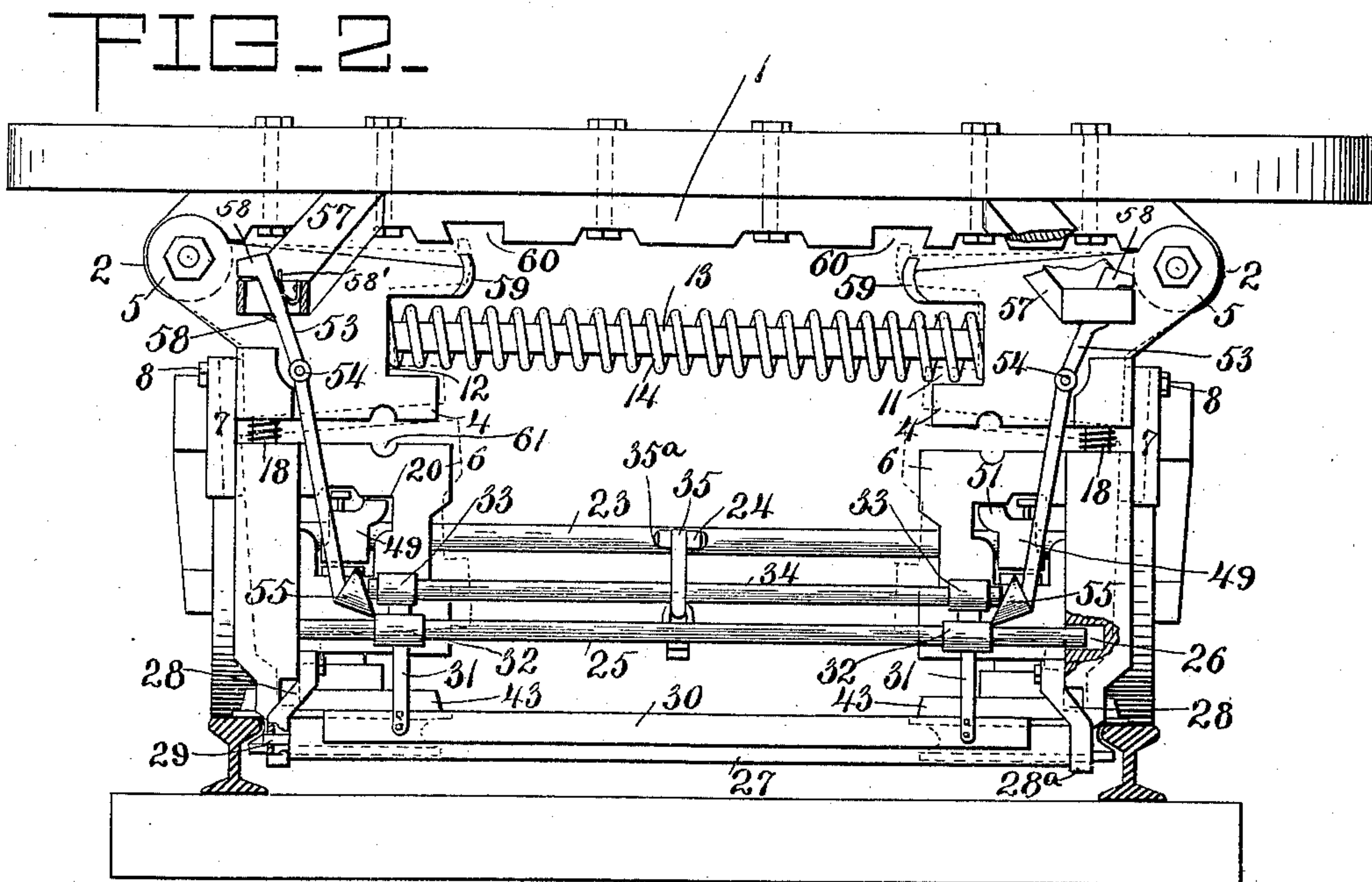
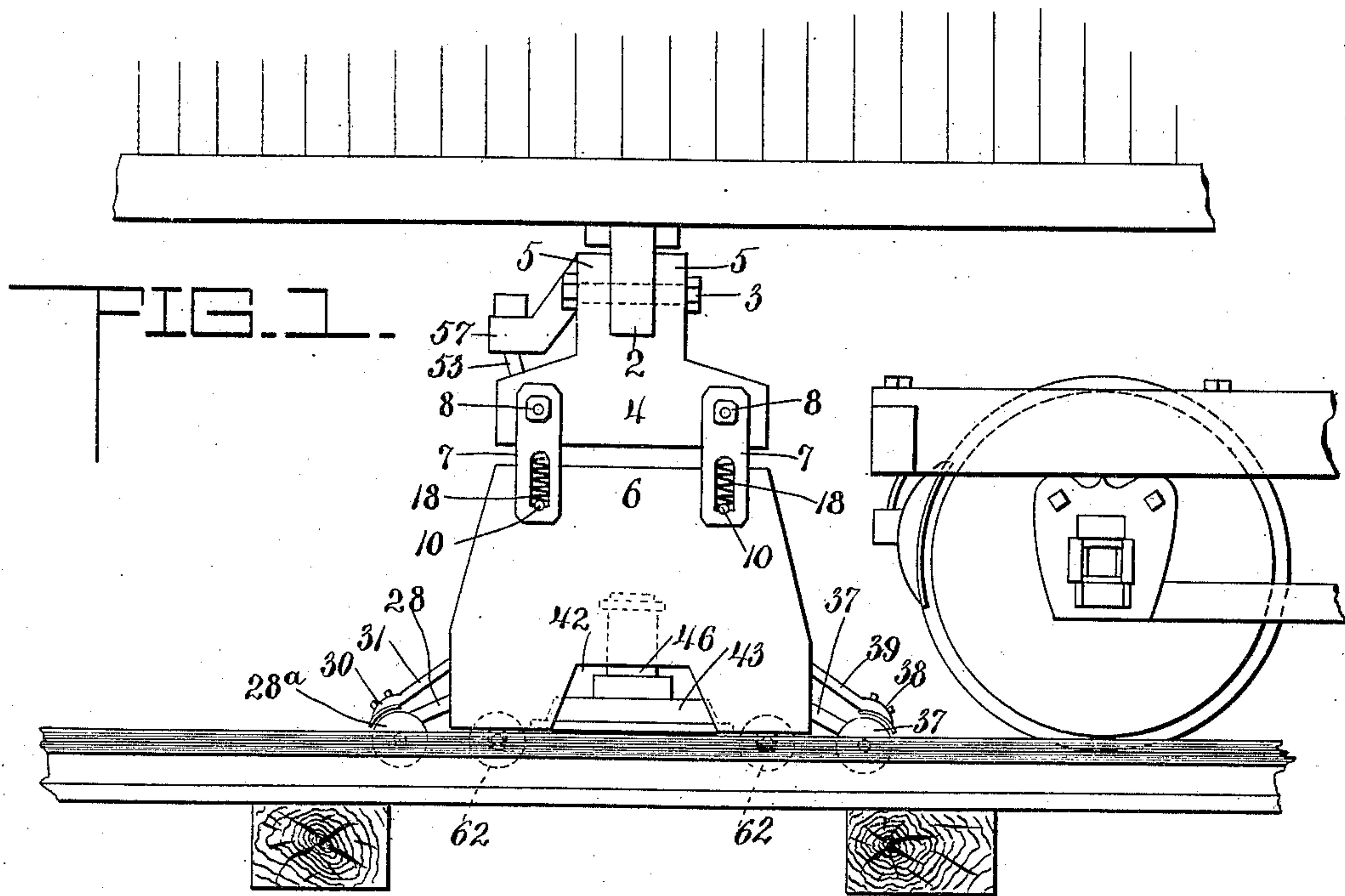
A. C. NICOLAS.

DEVICE FOR PREVENTING DERAILMENT OF RAILWAY COACHES.

(Application filed Mar. 18, 1897.)

(No Model.)

3 Sheets—Sheet 1.



WITNESSES

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3 Sheets—Sheet 2.

FIG. 3.

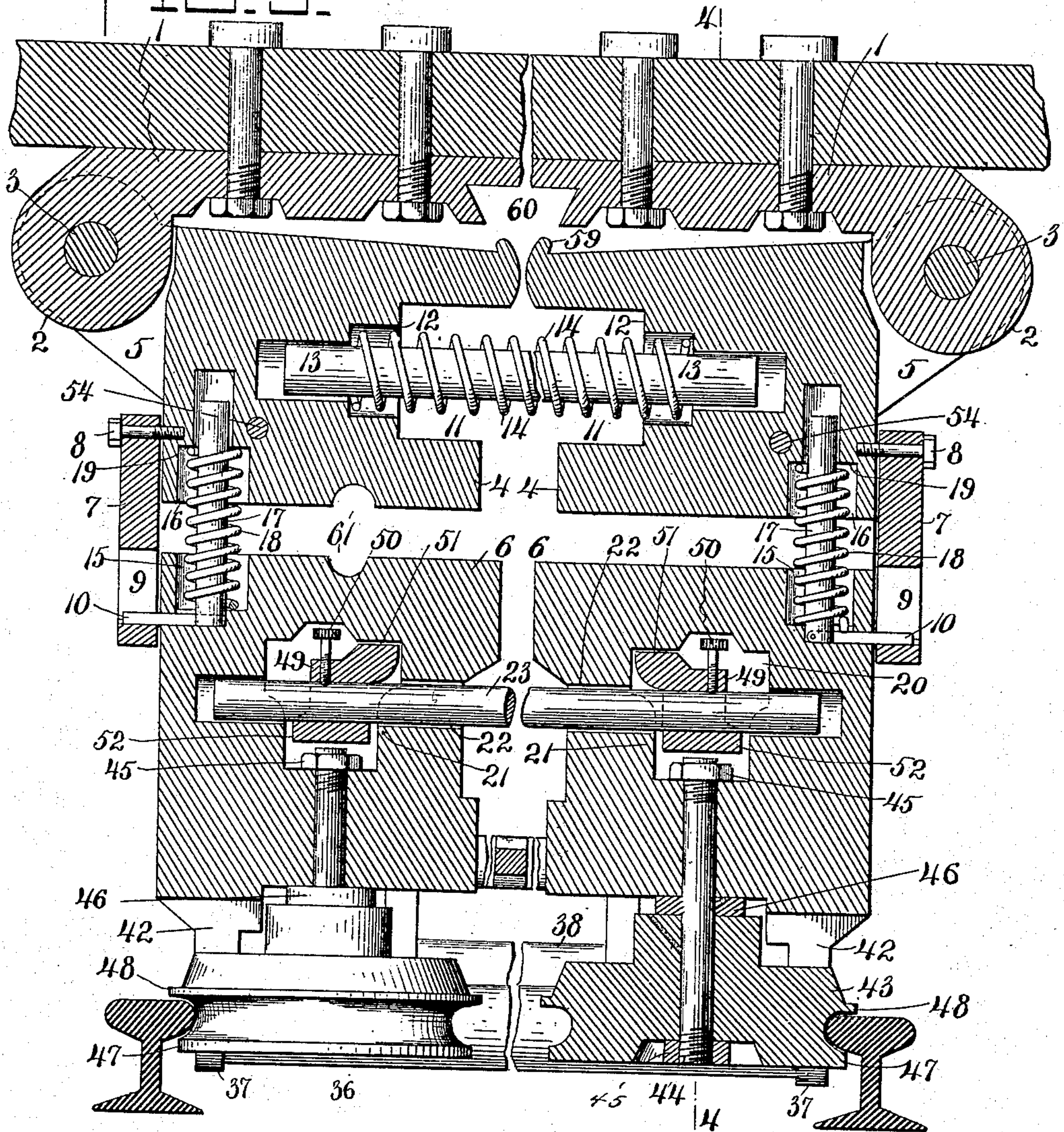
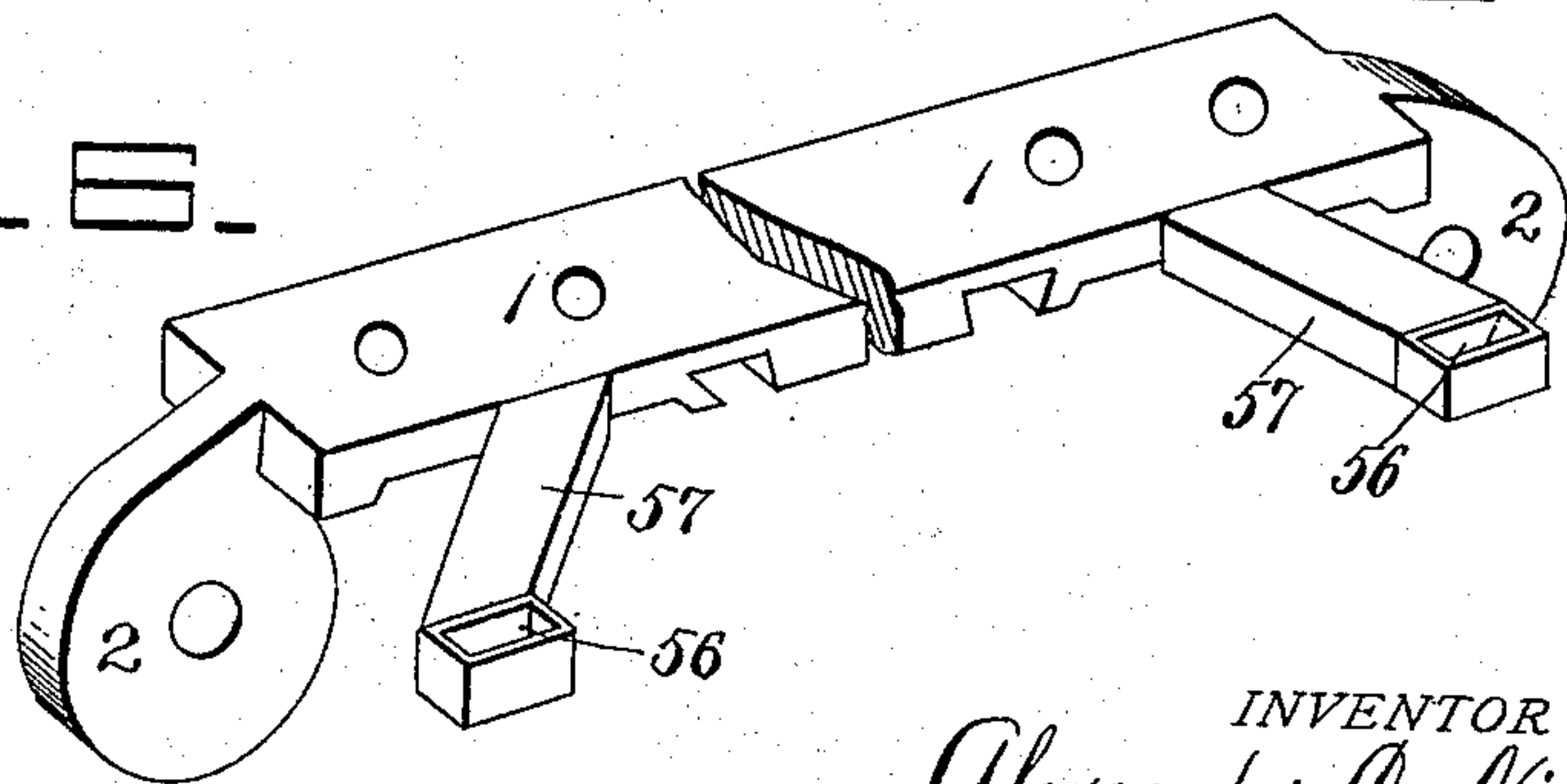


FIG. 4.



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3 Sheets—Sheet 3.

FIG 4.

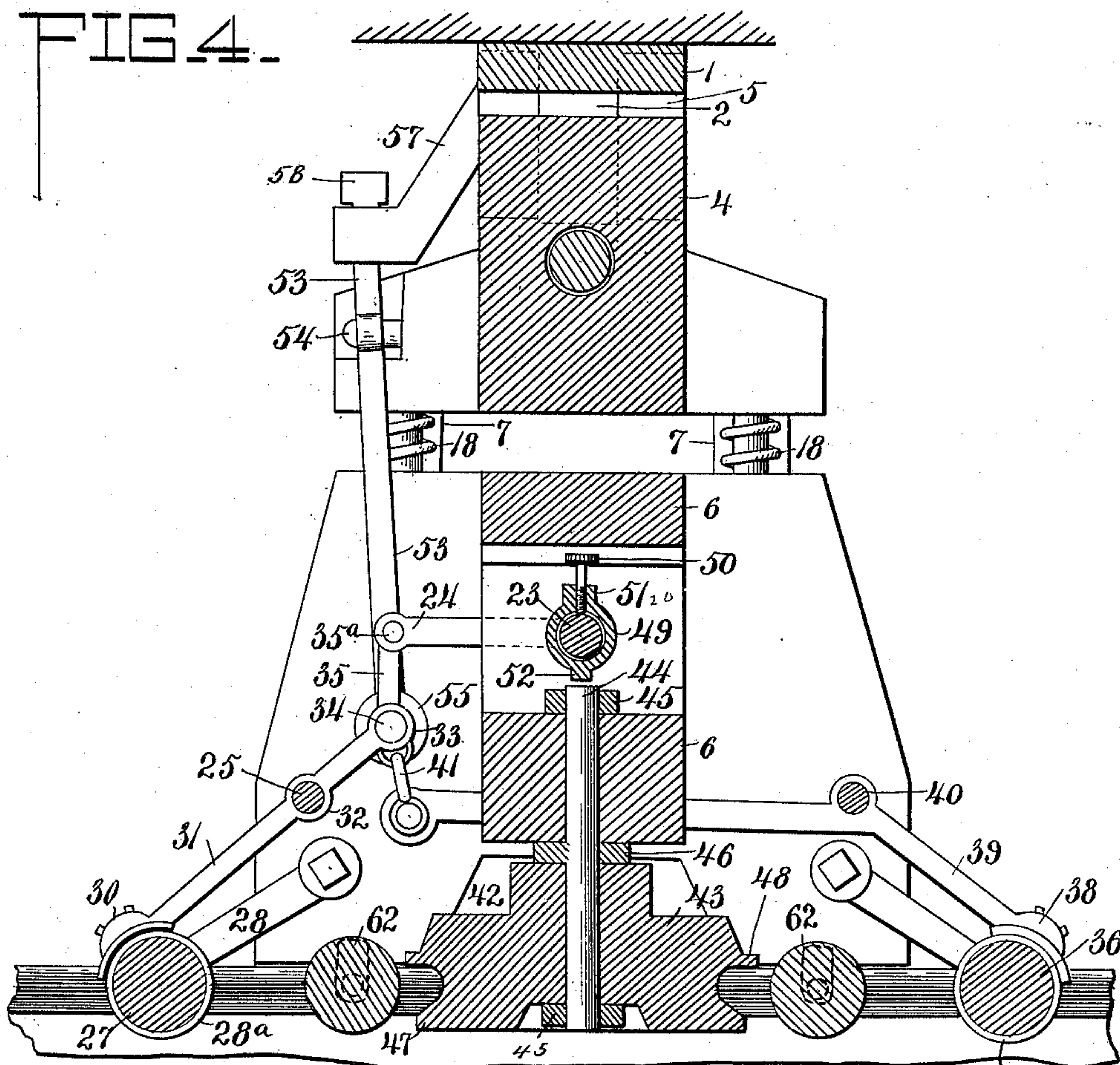
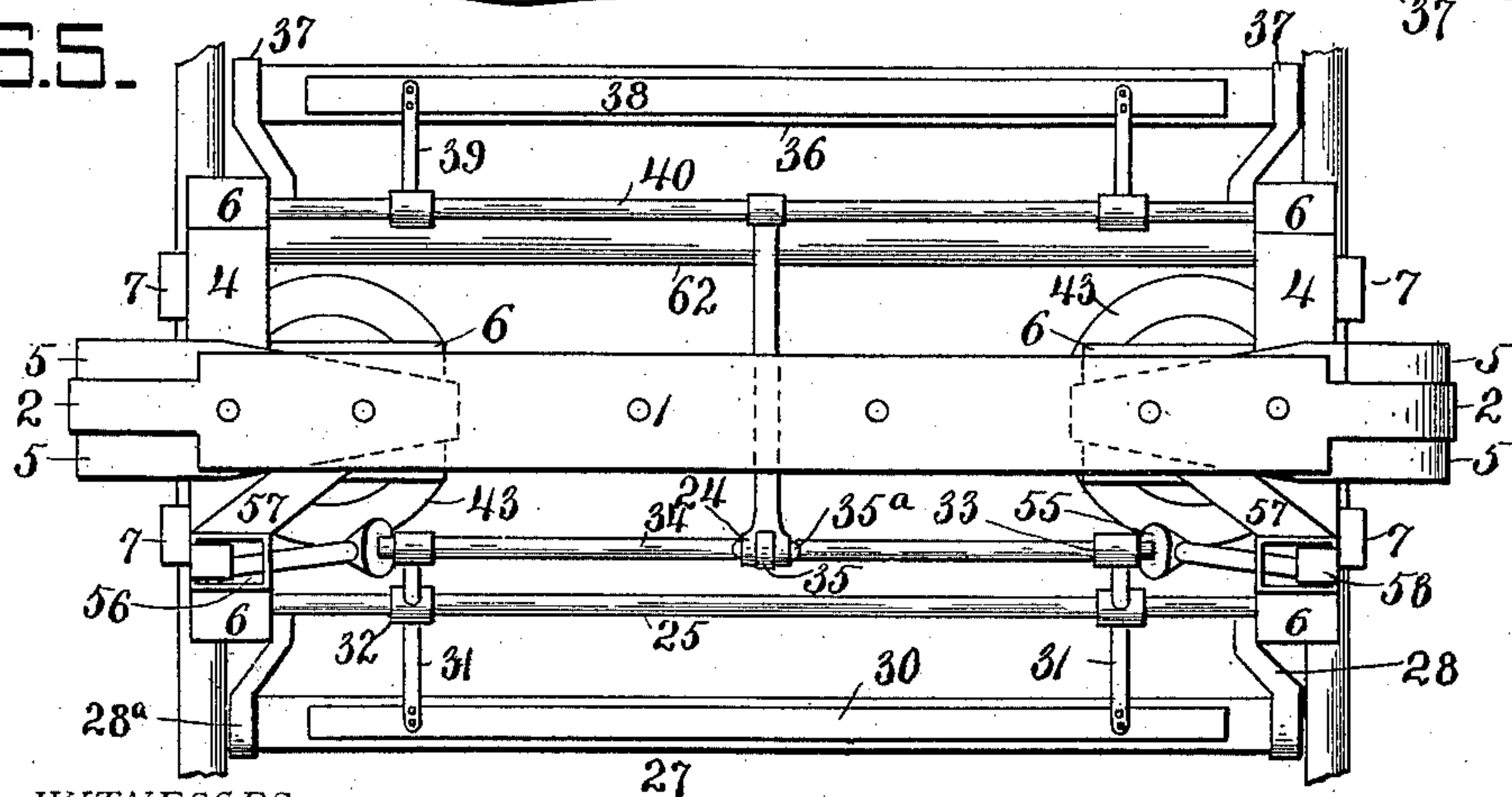


FIG. 5.



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UNITED STATES PATENT OFFICE.

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DEVICE FOR PREVENTING DERAILMENT OF RAILWAY-COACHES.

SPECIFICATION forming part of Letters Patent No. 618,283, dated January 24, 1899.

Application filed March 18, 1897. Serial No. 628,105. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER C. NICOLAS, a citizen of the United States, residing at Hawthorne, in the county of Emerald and State of Nevada, have invented certain new and useful Improvements in Devices to Prevent the Derailment of Railway-Coaches; 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.

This invention relates to devices for preventing derailment of railway-coaches and similar vehicles.

The object of the invention is to provide a device of the character mentioned adapted to be easily applied to railway-coaches, whereby the latter may be run at a high rate of speed without liability of leaving the tracks.

A further object of the invention is to provide in the construction of a device of the character mentioned simple and efficient means for engaging the track-rails, whereby it is entirely unnecessary for even the speed of a coach to be reduced when running upon curves, and hence permitting such movement of the coaches without special attention on the part of the operators thereof, and, furthermore, the invention aims to provide means for the purpose mentioned which may be constructed at a comparatively low figure and be readily applied to the coaches.

With these objects in view the invention consists, substantially, in the novel construction, combination, and arrangement of parts, as will be hereinafter fully illustrated, described, and claimed.

In the accompanying drawings, Figure 1 is a side elevation of the herein-described improvements illustrated as applied to a car, a sufficient portion of the latter being shown to disclose the relation of the improvements thereto. Fig. 2 is an end elevation of the car and the improved means for preventing derailing thereof, said means being illustrated in engagement with the track-rails. Fig. 3 is a transverse sectional view. Fig. 4 is a longitudinal sectional view on the line 4 4 of

Fig. 3. Fig. 5 is a top plan view, the portion of the car to which the improvements are applied being removed. Fig. 6 is a detail perspective view of the stationary attaching-bar and the slotted keepers carried thereby.

Similar numerals of reference designate corresponding parts throughout the figures of the drawings.

Referring to the drawings, 1 designates an attaching-bar, which may be of any approved material, and said bar is adapted to be secured to the bottom of a railway-coach for connecting the improved means for preventing derailing thereof to the same, and formed at each end of the bar 1 is a perforated ear 2, in each of which is disposed a pivotal bolt 3.

4 4 designate a pair of pivoted blocks, each of said blocks being provided with spaced parallel lugs 5, adapted to receive the perforated ears 2 of the attaching-bar 1 and be secured thereon by means of the bolts 3, and by reason of this connection it is quite obvious that the pivoted blocks 4 may be swung on the arc of circles with the bolts 3 as their centers.

The blocks 4 constitute the upper section of the herein-described improvements, and disposed beneath the same is a pair of sliding blocks 6, the blocks 4 and 6 being preferably formed of strong wood; but it is of course obvious that any other desired material may be substituted therefor, and in order that the blocks 6 may be connected to the blocks 4 a plurality of links 7 is secured to each of the blocks 4 by bolts 8 or their equivalent, and said links 7 are each provided with an elongated slot 9, in which a pin 10, carried by the blocks 6, is adapted to move. By reason of this it will be seen that the blocks 6 are movable for a limited extent independently of the pivoted blocks 4. The opposing ends of the blocks 4 are provided with inwardly-extending sockets 11, said sockets 11 gradually increasing in their diameter from the innermost portion thereof to the outer end, so that a series of shoulders 12 is thereby formed, and disposed in the sockets 11 and extending from each of the blocks 4 to the other is a transverse guide-rod 13, around

which a coiled spring 14 is encircled, and the ends of the coiled spring 14 are seated upon the innermost of the shoulders 12, so that the tendency of said spring is to force the blocks 4 normally apart, the length of the rod 13 being somewhat less than the entire distance from the inner end of the socket 11 of one of the blocks 4 to the inner end of the socket of the other block. This length of the rod 13 will permit the blocks 4 swinging upon their pivots and closing toward each other, as will be hereinafter fully described.

The upper edges of the blocks 6, near their outer ends, are provided with sockets 15, and formed in the lower edges of the blocks 4 at substantially opposite points to the sockets 15 are sockets 16, and extending from each of the sockets 15 and projecting into the socket 16 opposite thereto is a vertical guide-rod 17, around which a coiled spring 18 is disposed. Each of the sockets 16 is provided with a shoulder 19, and the upper ends of the springs 18 are adapted to be seated upon said shoulders 19, while the lower ends of said springs rest upon the inner ends of the sockets 15. The length of the guide-rods 17 is also less than the distance from the inner end of the sockets 16 to the inner end of the sockets 15, and hence it will be seen that the guide-rods 17 may freely slide within the sockets 15 and 16 as the blocks 6 are forced toward the blocks 4. The inner ends of the pins 10 are fitted upon the guide-rods 17, and it will be noted at this point that one of the guide-rods 17 is positioned adjacent to each end of the blocks 4 and 6, so that a proper movement of said blocks may be effected, the lower end of each of the springs 18 being riveted or otherwise suitably secured to the pins 10.

Formed in the web of each of the blocks 6 is an opening 20, the lower end of which is of less diameter than its upper end, so that a shoulder 21 is formed at the inner side of each of said openings, and extending transversely across the blocks 6 and having its ends seated in bearings 22, formed at the outer side of each of the openings 20, is a rotatable shaft 23, at the central portion of which is formed a bifurcated arm 24, being preferably integral with the shaft 23, so that movement of said arm will be insured when the shaft 23 is rotated. The shaft 23 is arranged at substantially the vertical center of the blocks 6, and disposed at one side of the shaft 23 and in a lower horizontal plane is a similar shaft 25, the ends of the shaft 25 being seated in sockets 26, formed in the inner faces of the blocks 6, and the length of the shaft 25 is such that the same may have a lateral play with respect to the blocks 6 as to freely move in the sockets 26 when said blocks 6 are moved upwardly toward the pivoted blocks 4.

27 designates a pilot-roller which extends entirely across from the outer side of one of the blocks 6 to the outer side of the other, the position of the roller 27 normally being be-

tween the rails of the track. In order to attach the roller 27, a bracket 28 is pivoted to said blocks at each end of the roller 27, the free ends of the brackets 28 having bearings 28^a for the spindles 29, formed at the ends of the roller 27, and the length of the spindles 29 is sufficient to permit the blocks 6 moving toward each other and upwardly, as occasion demands. A concave shoe 30 is adapted to contact with the roller 27, and said shoe 30 is arranged at one end of the blocks 6 and is secured to the lower ends of a plurality of swinging arms 31, each of said arms being provided at a point intermediate its ends with a transverse sleeve 32, through which passes the shaft 25, and secured thereon in any suitable manner. The upper ends of the swinging arms 31 are also provided with transverse sleeves 33, in which is secured a connecting-rod 34, and it will thus be seen that when the shoe 30 is elevated the shaft 25 rotates partially in its bearings 26, by which movement the connecting-rod 34 is lowered. A hinge-link 35 is mounted upon the connecting-rod 34, and the upper end of said link 35 receives a bolt 35^a or its equivalent, which passes through the arm 24, carried by the transverse shaft 23, and said bolt 35^a secures the hinge-link 35 in the bifurcation of said arm 24.

At the end of the blocks 6 opposite to that to which the pilot-roller 27 is attached is a similar roller 36, the ends of which are journaled in brackets 37, pivoted to said blocks 6, and arranged above the roller 36 is a concave shoe 38, which is connected to a swinging arm 39, fulcrumed upon a transverse shaft 40, which also extends across the blocks 6 at a point substantially opposite to the shaft 25, the arm 39 extending from the shaft 40 to a point adjacent to the connecting-rod 34, but beneath the latter, and in order that the arm 39 may be attached to said connecting-rod 34 a hinge-link 41 is employed, said link having its lower end attached to the swinging arm 39, while its upper end is connected to the lower end of the hinge-link 35. Through this medium it will be seen that whether the roller 27 or 36 shall contact with an obstruction, whether the obstruction be a grade-crossing or other form, the connecting-rod 34 will always be depressed, and thereby lower the bifurcated arm 24 for a purpose to be presently stated.

The lower end of each of the sliding blocks 6, at substantially its center, is provided with a recess or opening 42, and arranged in said opening is a horizontally-disposed guard-wheel 43, adapted to engage one of the rails of the track, and through the medium of these guard-wheels when the same are in engagement with the track the coach is prevented being derailed therefrom. Each of the guard-wheels 43 is provided with a vertically-disposed spindle 44, the upper and lower ends of which are screw-threaded for the accommodation of nuts 45, and formed on the spindle 44 at such a distance from the

lower nut 45 as will correspond with the thickness of the guard-wheel 43 is a shoulder 46, by which when the lower nut 45 is screwed on the spindle 44 the guard-wheel is retained upon the spindle 44 in a substantially fixed position, but free to rotate thereon. The guard-wheel 43 has at its lower end an annular flange 47, and formed on the body of the wheel 43 above the flange 47 is a similar flange 48, the latter being of a greater diameter than the flange 47, and the inner end of the space between the flanges 47 and 48 is rounded, so that the sides of the heads of the rails may snugly fit therein, the normal position of the guard-wheels 43 being upon the heads of the rails and adapted to roll along the same.

It will be observed that one of the guard-wheels 43 is disposed at each side of the frame constituted by the blocks 4 and 6, and each of said wheels is disposed in one of the openings or recesses 42, so that a portion of the same may extend through said opening for free contact with the track-rails. The upper end of each of the spindles 44, above the shoulders 46 thereof, extends through one of the blocks 6, so that the threaded end thereof projects into the opening 20, the upper nut 45 being screwed upon said threaded portion, and thereby retaining the spindles 44 in the blocks 6.

Mounted upon each end of the transverse shaft 23 is a double cam 49, which is secured upon said shaft 23 by a screw 50, and formed on the inner ends of the cams 49 are cam-surfaces 51, which coöperate with shoulders 21 when the shaft is rotated for forcing the blocks 6 inward toward each other to throw the wheels 43 away from the rails. At points on the cams opposite the lugs 51 and on their outer ends other cam-surfaces 52 are formed, the last-named shoulders coöperating with opposing shoulders in the blocks to force the blocks away from each other and cause the wheels 43 to engage the rail. It will thus be seen that by the rotation of the shaft 23 the wheels 43 are moved into or out of engagement with the rails.

In order that the blocks 4 of the device may be locked in a fixed position when the guard-wheels 43 are engaging the track-rails, a plurality of latch-levers 53 is employed, one of said levers being disposed on each side of the device and pivoted at a point midway its ends by a bolt 54 or its equivalent to one of the blocks 4. The normal position of the levers 53 is oblique in respect to the blocks 4 and 6, and formed at the lower end of each of the levers 53 is an enlargement 55, the inner face of which is smooth or flat, and these enlargements 55 normally lie in the direct downward path of the ends of the connecting-rod 34, so that as said rod descends the ends thereof contact with the inner faces of the enlargements 55 and force the same apart. This movement of the enlargements 55, as is obvious, will swing the upper ends of the levers

53 toward each other, and each of said upper ends of the levers 53 is adapted to work within a slot 56, extending transversely of a keeper 57, which is preferably formed integral with the attaching-bar 1, one of these keepers being positioned at each end of the bar 1 and thereby in a position for receiving the upper end of each of the levers 53. The levers 53 at their upper ends are each provided with a pair of spaced retaining-lugs 58, the upper one of which bears against the upper side of the keeper 57, and the lower of said lugs contacting with the lower side of said keeper and at one end of the slot 56 when the levers 53 are in their normal position. When the levers 53 are shifted on their fulcrums, the lower of the retaining-lugs 58 is disengaged from the lower side of the keeper 57, and hence it is apparent that the levers 53 may readily pass upwardly through the slots 56, which will be presently more fully described. The upper ends of the levers 53 are held outward in engagement with the keepers by means of springs 58', located in the slots of the keepers.

Each of the blocks 4 at its upper inner end is provided with a transversely-extending flange 59, and each of said flanges is adapted to enter a socket 60, formed in the lower face of the attaching-bar 1, when the blocks 4 are rocked upward, as in Fig. 2, (dotted lines,) and, if so desired, the lower edges of the blocks 4 and the upper edges of the blocks 6 may be provided with oppositely-arranged notches or recesses 61, through which the air-brake pipes may pass, and by this construction the perfect operation of the device will not be prevented.

The operation of the herein-described device for preventing derailment of railway-coaches is as follows: In practice one or both ends of the coach is supplied with one of the devices, and as a grade-crossing or any obstruction in the path of the coach is approached the guard-wheels 43 roll along the heads of the rails; but immediately the crossing or switch or the obstruction is arrived at either of the pilot-rollers 27 or 36, according to the direction in which the coach is moving, contacts with the obstruction, and by reason of said rollers being pivoted the same will rise. This rising of the roller 27 or 36, as the case may be, causes the same to contact with the shoes 30 or 38, respectively, said shoes also rising and swinging upon their fulcrums 25 or 40. By reason of the shoes 30 and 38 being connected to the connecting-rod 34 by means of the arms 31 and 39 it is apparent that when the inner ends of the arms 31 and 39 are depressed the connecting-rod 34 is also depressed and the ends of said rod 34 are brought into contact with the inner faces of the enlargements 55. When the connecting-rod 34 engages the enlargements 55, the levers 53 are spread outwardly and caused to swing upon their fulcrums 54, the lower retaining-lugs 58 being thus released from the

ends of the slots 56, which they are adapted to normally engage. After the levers 53 have been thus swung the blocks 4 and 6 are also free to move to the position shown in dotted lines in Fig. 2, and it will be observed that this operation which has just been described is effected when the pilot-roller 27 or 36 contacts with the obstruction and before the obstruction contacts with a plurality of lifting-rollers 62, the latter being journaled in hangers depending from the lower side of the blocks 6 between the guard-wheels 43 and the pilot-rollers 27 and 36. When the obstruction has contacted with the lifting-rollers 62, it is apparent that the same must rise in order to pass the obstruction, and by reason of this the blocks 6 must necessarily move upwardly against the pressure of the coiled springs 18. This upward movement of the blocks 6 will also swing the pivoted blocks 4 upon their pivots 3, and from the fact that these blocks are secured to the pivots 3 the same swing on an arc of a circle with the pivots 3 as the center thereof. As the blocks 4 thus swing the same compress the coiled spring 14, and in view of the pivoted blocks 4 having this swinging movement it is of course necessary that the blocks 6 must move toward each other, since said blocks are connected to the pivoted blocks 4 by the guide-rods 17. The movements of the blocks 4 and 6 just described will bring the same to the position shown in dotted lines in Fig. 2 and cause the coiled springs 14 and 18 to be somewhat compressed, the sockets receiving the rods 13 and 17 and the shafts 23 25 and spindles of the pilot-rollers 27 and 36 and the lifting-rollers 62 permitting a sufficient movement of the blocks 4 and 6 as to permit the same to close. The device is then in the position by which the same may pass over a crossing or any obstruction on the track, and it will be observed that during the upward and inward movement of the blocks 6 the guard-wheels 43 are released from the heads of the track-rails, the transverse shaft 23 being rotated when the connecting-rod 34 is depressed, and by this rotation of the shaft 23 the cams operate upon the blocks which carry the guard-wheels 43, so that said blocks are drawn together and the guard-wheels disengaged from the rails. When the obstruction has been passed, it is of course apparent that there is nothing in the way to prevent the downward movement of the blocks 6, and by reason of this the springs 14 and 18 expand, forcing the blocks 6 downwardly and causing the pivoted blocks 4 to swing on the bolts 3 and again resume their normal position. As the pilot-rollers 27 and 36 descend the connecting-rod 34 is elevated and the shaft 23 rotated, so that the locking-lugs 52 are positioned over the upper end of the spindles 44, the lower ends of the levers 53 being thus enabled to swing back to their normal position. As the blocks 4 and 6 resume their normal position the upper ends of the latch-

levers also pass downwardly through the slots 56 and the lugs 58 on said levers are again brought into engagement with the keepers 57, so that the blocks 4 and 6 will be held in rigid position and the guard-wheels 43 retained upon the heads of the track-rails until another crossing or obstruction is approached, when a similar operation of the device will take place.

For the purpose of lubricating the guard-wheels an opening may be formed in each of the collars above the same, adapted to receive a suitable lubricant.

From the foregoing description it will be seen that the herein-described improvements provide a device which is designed to be entirely automatic in its operation both as to disengaging the guard-wheels 43 and also engaging the same with the track-rails, and said guard-wheels when brought into engagement with the rails will prevent the cars being derailed. The coaches are thereby enabled to run at a high rate of speed without liability of becoming derailed, and this may be effected either upon broad or narrow gauge roads. It will, however, be noted that the fish-plates of the rails must necessarily be somewhat decreased in width from that ordinarily employed, so that the lower flanges 47 of the guard-wheels 43 may pass along the track-rails without being displaced therefrom, and thus said guard-wheels will occupy the same position with respect to the rails at all points throughout the line.

The device may be constructed at a comparatively low figure, and it will be understood that the same is susceptible of changes in the form, proportion, and minor details of construction, which may accordingly be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is—

1. In a device for preventing derailment of cars, the combination with a guard-wheel and means for attaching the same to a railway-coach or the like, of means for automatically engaging said guard-wheel with the track and releasing the same therefrom in passing a switch or similar obstruction, substantially as described.

2. In a device for preventing derailment of cars, the combination with a guard-wheel and means for attaching the same to a railway-coach or the like, of means for automatically moving said guard-wheel into engagement with the rail and locking the guard-wheel in such position, substantially as described.

3. In a device for preventing derailment of cars, the combination with a guard-wheel and means for attaching the same to a railway-coach or the like, of means for engaging said guard-wheel with the rail and locking the same in such position, and means for automatically releasing the wheel from said track

in passing a switch or similar obstruction, substantially as described.

4. In a device of the class described, the combination with a guard-wheel and means for attaching the same to a railway-coach or the like, of a frame arranged between said attaching means and the guard-wheel and adapted to support said wheel in proper relation to the track for engagement therewith, and means for automatically engaging the wheel with the track and releasing the same therefrom in passing a switch or similar obstruction, substantially as described.

5. In a device of the class described, the combination with a frame adapted to be applied to a railway-coach or the like, of a plurality of guard-wheels carried by said frame, a pilot-roller also carried by said frame, and connections between said pilot-roller and the guard-wheels, whereby the latter are adapted to be automatically brought into engagement with and released from the track when an obstruction is contacted with and passed over by said pilot-roller, substantially as described.

6. In a device of the class described, the combination with a frame adapted to be applied to a railway-coach or the like, of a plurality of guard-wheels carried by said frame and suitably journaled therein, means for automatically engaging said wheels with the track, and means for locking said wheels in such position, whereby said wheels are prevented being displaced from the track, substantially as described.

7. In a device of the class described, the combination with a frame comprising a plurality of relatively-movable blocks adapted to be applied to a railway-coach or the like, of a plurality of guard-wheels carried by the blocks, and means acting upon the blocks for automatically forcing said wheels into engagement with the track and releasing the same therefrom, substantially as described.

8. In a device of the class described, the combination with a frame adapted to be applied to a railway-coach or the like and comprising relatively-movable blocks, of a plurality of guard-wheels carried by said frame and adapted to be engaged with the track, and means for holding the blocks fixed with relation to each other when the guard-wheels are in engagement with the track, substantially as described.

9. In a device of the class described, the combination with a frame adapted to be applied to a railway-coach or the like and comprising relatively-movable blocks, of a plurality of guard-wheels carried by said frame and adapted to engage the track, means carried by said frame for retaining the sections thereof in locked position to hold the guard-wheels in engagement with the rails, and means for releasing the blocks of the frame from their locked position to free the guard-wheels from engagement with the track in passing a switch or similar obstruction, substantially as described.

10. In a device of the class described, the combination with a frame adapted to be applied to a railway-coach or the like and comprising relatively-movable blocks, of a plurality of guard-wheels carried thereby and adapted to engage the track, means for retaining the blocks of the frame fixed so as to hold the guard-wheels in engagement with the track, and means for automatically releasing the first-mentioned means in passing a switch or similar obstruction, substantially as described.

11. In a device of the class described, the combination with a frame adapted to be applied to a railway-coach or the like, of a plurality of guard-wheels journaled in said frame and adapted to normally engage the track, a pilot-roller also carried by said frame, and connections between said pilot-roller and the guard-wheels, whereby when said connections are operated the guard-wheels are released from engagement with the track, substantially as described.

12. In a device of the class described, the combination with a frame comprising a plurality of sliding blocks, of guard-wheels carried by said frame and adapted to be brought into engagement with the track, and means for retaining the guard-wheels in engagement with the track, substantially as described.

13. In a device of the class described, the combination with a frame adapted to be applied to a railway-coach or the like, and comprising a plurality of pivoted blocks and a plurality of sliding blocks, of a plurality of guard-wheels carried by said sliding blocks adapted to normally engage the track, a pilot-roller journaled to the frame, and suitable connections between the pilot-roller and the frame, whereby when said pilot-roller is elevated the blocks of the frame are allowed to close together and thereby release the guard-wheels from engagement with the track, substantially as described.

14. In a device of the class described, the combination with a frame adapted to be applied to a railway-coach or the like and comprising a plurality of pivoted blocks, and a plurality of sliding blocks, of a plurality of guard-wheels carried by said frame and adapted to normally engage the track, a pilot-roller also carried by the frame and adapted to swing thereon, a shaft journaled in said frame, swinging arms carried by said shaft and adapted to be contacted with by the pilot-roller when the latter is elevated, and connections between said swinging arms and the guard-wheels, whereby the latter may be released from engagement with the track, substantially as described.

15. In a device of the class described, the combination with a frame adapted to be applied to a railway-coach or the like and comprising a plurality of pivoted blocks, a plurality of sliding blocks, guide-rods arranged between said pivoted blocks and the sliding blocks, and springs mounted on said rods for

forcing the sliding blocks away from the pivoted blocks, of a plurality of guard-wheels carried by the frame and adapted to normally engage the track, a pilot-roller carried by the frame and adapted to swing thereon, a latch-lever for holding the sliding blocks and the pivoted blocks relatively fixed, and suitable connections between the pilot-roller and said latch-lever, whereby the latter may be released when the pilot-roller is elevated and the blocks of the frame permitted to move toward each other to release the guard-wheels from engagement with the track, substantially as described.

16. In a device of the class described, the combination with a sectional frame adapted to be applied to a railway-coach or the like, and comprising a plurality of pivoted blocks, a plurality of sliding blocks, and connections between said pivoted blocks and the sliding blocks, whereby the latter are movable independently of the pivoted blocks, of a plurality of guard-wheels carried by said frame and adapted to normally engage the track, substantially as described.

17. In a device of the class described, the combination with the sectional frame adapted to be applied to a railway-coach or the like and comprising a plurality of pivoted blocks, a plurality of sliding blocks, guide-rods between said pivoted blocks and sliding blocks, springs mounted upon said guide-rods for forcing the sliding blocks away from the pivoted blocks, and suitable link connections between said pivoted blocks and the sliding blocks, whereby the latter are movable independently of the pivoted blocks, of guard-wheels carried by the frame and adapted to normally engage the track, substantially as described.

18. In a device of the class described, the combination with a sectional frame adapted to be applied to a railway-coach or the like and comprising a plurality of pivoted blocks, a plurality of sliding blocks, guide-rods between said pivoted blocks and sliding blocks, springs mounted upon said guide-rods for forcing the sliding blocks away from the pivoted blocks, and suitable link connections between said pivoted blocks and the sliding blocks, of guard-wheels carried by the frame and adapted to normally engage the track, and means also carried by the frame and adapted to automatically release said guard-wheels from engagement with the track, substantially as described.

19. In a device of the class described, the combination with a sectional frame adapted to be applied to a railway-coach or the like, and comprising a plurality of pivoted blocks, a plurality of sliding blocks, springs interposed between the pivoted blocks and the sliding blocks for forcing the latter from the pivoted blocks, and link connections between the pivoted blocks and the sliding blocks, whereby the latter are movable independently of the pivoted blocks, of a plurality of guard-

wheels carried by the frame, a pilot-roller carried by the frame and hingedly mounted thereon, a latch-lever carried by the frame and adapted to retain the blocks thereof fixed, and suitable connections between the pilot-roller and said latch-lever, whereby when said pilot-roller is elevated the latch-lever is released and the blocks of the frame adapted to close to free the guard-wheels from engagement with the track, substantially as described.

20. In a device of the class described, the combination with a sectional frame adapted to be applied to a railway-coach or the like and comprising a plurality of pivoted blocks, a plurality of sliding blocks, and connections between said pivoted blocks and sliding blocks to permit the latter being movable independently of the pivoted blocks, of a plurality of guard-wheels carried by the frame and suitably journaled thereto, a pilot-roller hingedly connected to the frame, a latch-lever pivotally mounted upon the frame, a keeper engaged by said latch-lever, whereby the blocks are held fixed with relation to each other, and connections between the pilot-roller and the latch-lever, whereby the latter is released from the keeper when the pilot-roller is elevated and the blocks of the frame adapted to close together for releasing the guard-wheels from the track, substantially as described.

21. In a device of the class described, the combination with a sectional frame adapted to be applied to a railway-coach or the like and comprising a plurality of pivoted blocks, a plurality of sliding blocks, and connections between the pivoted blocks and the sliding blocks, whereby the latter are movable independently of the pivoted blocks, of a plurality of guard-wheels carried by the frame and suitably journaled thereto, a latch-lever carried by the frame, a keeper engaged by said latch-lever, whereby the blocks are held fixed, with relation to each other, a shaft journaled in the frame, a pilot-roller hingedly connected to the frame, swinging arms mounted upon said shaft, a shoe connected to the swinging arms and adapted to be engaged by the pilot-roller when the latter is elevated, and a connecting-rod carried by the swinging arms, said connecting-rod being adapted to engage the latch-lever for releasing the same from engagement with the keeper when the connecting-rod is depressed, whereby the sections of the frame may close together and release the guard-wheels from engagement with the track, substantially as described.

22. In a device of the class described, the combination with a frame adapted to be applied to a railway-coach or the like, of a guard-wheel carried by said frame and adapted to engage the track, a transverse shaft journaled in said frame, a collar mounted on said shaft and provided with a locking-lug adapted to be normally positioned over said guard-wheel to prevent vertical play of the

latter, a shaft also journaled in the frame and away from the first-mentioned shaft, a pilot-roller hingedly connected to the frame, a swinging arm mounted upon the second shaft and adapted to have connection with the pilot-roller, and connections between said swinging arm and the shaft upon which the collar is mounted, whereby when the pilot-roller is elevated and the swinging arm depressed the shaft upon which the collar is mounted is partially rotated to move the locking-lug on the collar away from the guard-wheel, substantially as described.

23. In a device of the class described, the combination with a frame adapted to be applied to a railway-coach or the like, said frame comprising a plurality of pivoted blocks, a plurality of sliding blocks, slotted links connected to the pivoted blocks, and pins carried by the sliding blocks and working within the slots of the links, whereby the sliding blocks are movable independently of the pivoted blocks, of a plurality of guard-wheels adapted to normally engage the track, substantially as described.

24. In a device of the class described, the combination with a frame adapted to be applied to a railway-coach or the like, said frame comprising a plurality of pivoted blocks, a plurality of sliding blocks, slotted links connected to the pivoted blocks, and pins carried by the sliding blocks and working within the slots of the links, whereby the sliding blocks are movable independently of the pivoted blocks, of a plurality of guard-wheels adapted to normally engage the track, and means for automatically releasing said guard-wheels from engagement with the track, substantially as described.

25. In a device of the class described, the combination with a frame adapted to be applied to a railway-coach or the like, said frame comprising a plurality of pivoted blocks, a plurality of sliding blocks, a transverse guide-rod arranged between said pivoted blocks and loosely mounted in sockets therein, a spring mounted upon said transverse guide-rod and adapted to force the pivoted blocks to their normal position, guide-rods interposed between the pivoted blocks and the sliding blocks, springs mounted upon said guide-rods and adapted to force the sliding blocks away from the pivoted blocks, and link connections between the pivoted blocks and the sliding blocks, whereby the latter are movable independently of the pivoted blocks, of a plurality of guard-wheels adapted to normally engage the track, substantially as described.

26. In a device of the class described, the combination with a frame adapted to be applied to a railway-coach or the like, said frame comprising a plurality of pivoted blocks, a plurality of sliding blocks, a transverse guide-rod arranged between said pivoted blocks and loosely mounted in sockets therein, a spring mounted upon said trans-

verse guide-rod and adapted to force the pivoted blocks to their normal position, guide-rods interposed between the pivoted blocks and the sliding blocks, springs mounted upon said guide-rods and adapted to force the sliding blocks away from the pivoted blocks, and link connections between the pivoted blocks and the sliding blocks, whereby the latter are movable independently of the pivoted blocks, of a plurality of guard-wheels adapted to normally engage the track, and means for automatically releasing the guard-wheels from the track, substantially as described.

27. In a device of the class described, the combination with a frame adapted to be applied to a railway-coach or the like, of a plurality of guard-wheels journaled to said frame and adapted to normally engage the track, a transverse shaft journaled in the frame, cams mounted upon said shaft, a similar shaft also journaled in said frame, a pilot-roller hingedly connected to the frame, a swinging arm mounted upon the second shaft, a shoe connected to said swinging arm and adapted to be contacted with by the pilot-roller when the latter is elevated, a bifurcated arm carried by the transverse shaft upon which the collars are mounted, a rod carried by the swinging arm, and a hinge-link connected to the bifurcated arm and the connecting-rod, whereby when the pilot-roller is elevated and the swinging arm is depressed the shaft upon which the cams are mounted is partially rotated, substantially as described.

28. In a device of the class described, the combination with a frame adapted to be applied to a railway-coach or the like, and comprising relatively-movable blocks, of a plurality of guard-wheels carried by said frame and adapted to normally engage the track, a latch-lever carried by the frame, a keeper engaged by said latch-lever whereby the said blocks of the frame are held fixed, the lower end of said lever being provided with an enlargement, a pilot-roller hingedly connected to the frame, a swinging arm journaled to said frame, and a connecting-rod carried by said swinging arm, the enlargement formed on the latch-lever lying in the downward path of said connecting-rod, whereby when the pilot-roller is elevated to depress the swinging rod the connecting-rod contacts with the enlargement on the latch-lever and frees the latter from the keeper to permit the blocks of the frame to move together and release the guard-wheels from engagement with the track, substantially as described.

29. In a device of the class described, the combination with an attaching-bar, of a pair of blocks pivotally connected to said attaching-bar, a second pair of blocks carried by the aforesaid blocks, a plurality of guard-wheels carried by the second pair of blocks, and means for automatically engaging said guard-wheels with the track and releasing the same therefrom, substantially as described.

30. In a device of the class described, the combination with a frame adapted to be applied to a railway-coach or the like, of a plurality of guard-wheels carried by said frame
5 and adapted to engage the track, means for automatically forcing the guard-wheels into engagement with and releasing the same from the track, and a lifting-roller journaled to said frame and adapted for elevating the lat-
10 ter, substantially as described.

31. In a device of the class described, the combination with a frame adapted to be applied to a railway-coach or the like, said frame comprising a plurality of pivoted blocks, a
15 plurality of sliding blocks, a guide-rod interposed between the pivoted blocks, a spring mounted upon said guide-rods and bearing against the pivoted blocks to normally force the pivoted blocks apart, and link connec-
20 tions between the pivoted blocks and the sliding blocks, of a plurality of guard-wheels carried by the frame and arranged to rotate in a horizontal plane so as to normally engage the track, spindles for said guide-wheels hav-
25 ing shoulders formed thereon to retain the guard-wheels in a substantially fixed position but permit the same rotating, a plurality of pilot-rollers hingedly connected to the frame, a plurality of swinging arms arranged
30 upon the frame, rotatable shafts for said arms, a connecting-rod carried by one pair of said swinging arms, a hinge-link connection between the other pair of the swinging arms and the connecting-rod, a transverse shaft
35 mounted in said frame, a bifurcated arm car-

ried by said shaft, a plurality of cams also carried by said shaft and cooperating with the blocks which carry the guard-wheels, a hinged link connection between the bifur-
40 cated arm and the connecting-bar, shoes carried by the swinging arms and adapted to be contacted with by the pilot-rollers when the latter are elevated, a plurality of latch-levers pivoted to the frame, an attaching-bar for se-
45 curing the frame to the coach or the like, a plurality of slotted keepers carried by said bar and adapted to be engaged by said latch-levers, whereby the sections of the frame are retained in rigid position, said latch-levers
50 lying in the downward path of the connecting-rod, said connecting-rod being adapted to contact with the latch-levers for releasing the same when said connecting-rod descends, and a plurality of lifting-rollers journaled to the frame and adapted to close together the
55 blocks thereof for releasing the guard-wheels from engagement with the rails, the springs interposed between the pivoted blocks and sliding blocks automatically retaining the guard-wheels and forcing the same into en-
60 gagement with the track, substantially as described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

ALEXANDER C. NICOLAS.

Witnesses:

ANTONIO LAIOLO,
ROBT. H. WRIGHT.