No. 672,116. Patented Apr. 16, 1901.

G. WESTINGHOUSE.

DRAW GEAR AND BUFFING APPARATUS.

(Application filed Aug. 18, 1900.)

(No Model.) 4 Sheets—Sheet 1.

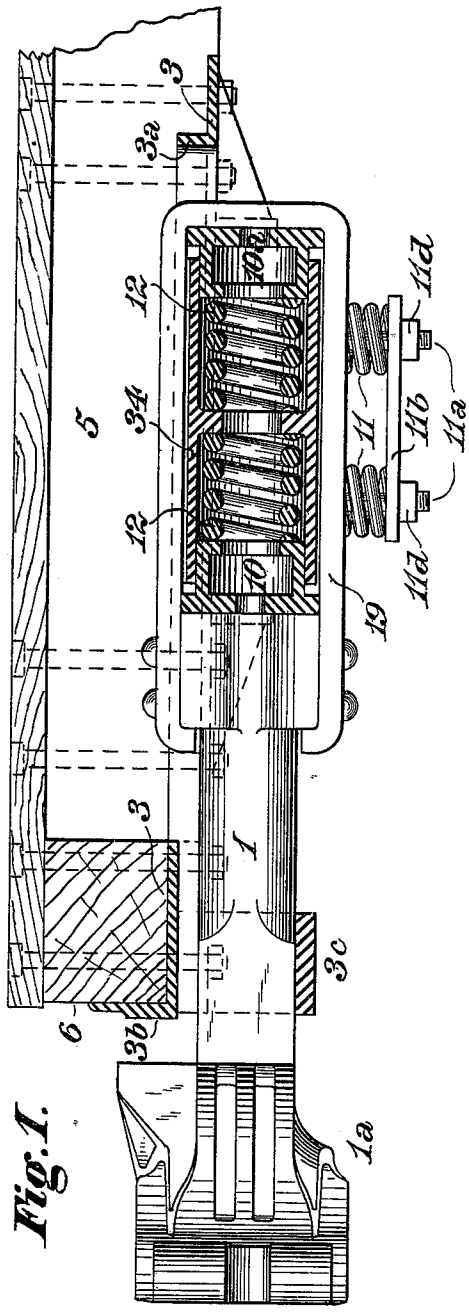

Fig. 1.

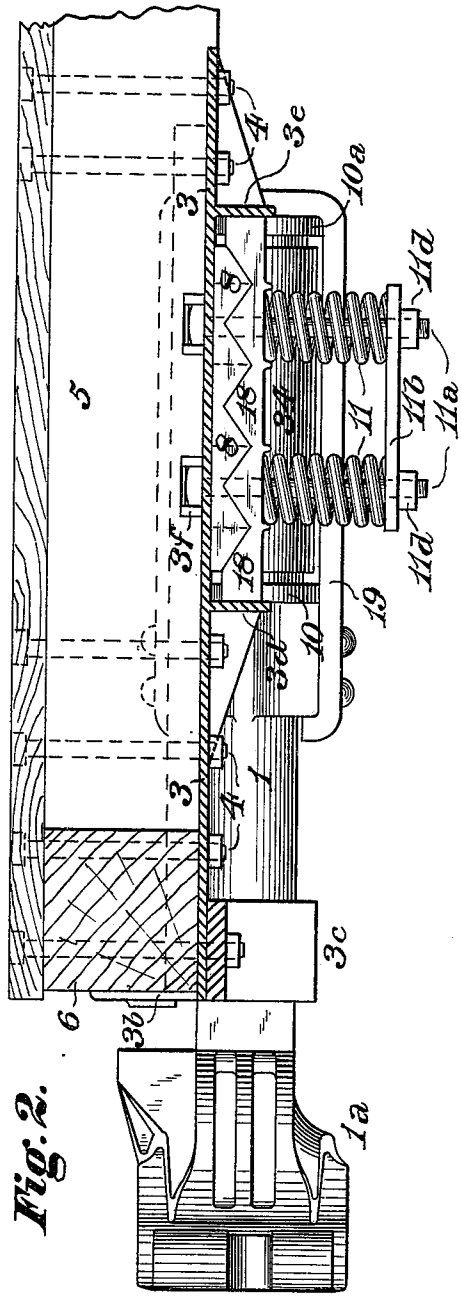

Fig. 2.

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DRAW GEAR AND BUFFING APPARATUS.

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(No Model.) 4 Sheets—Sheet 2.

Fig. 3.

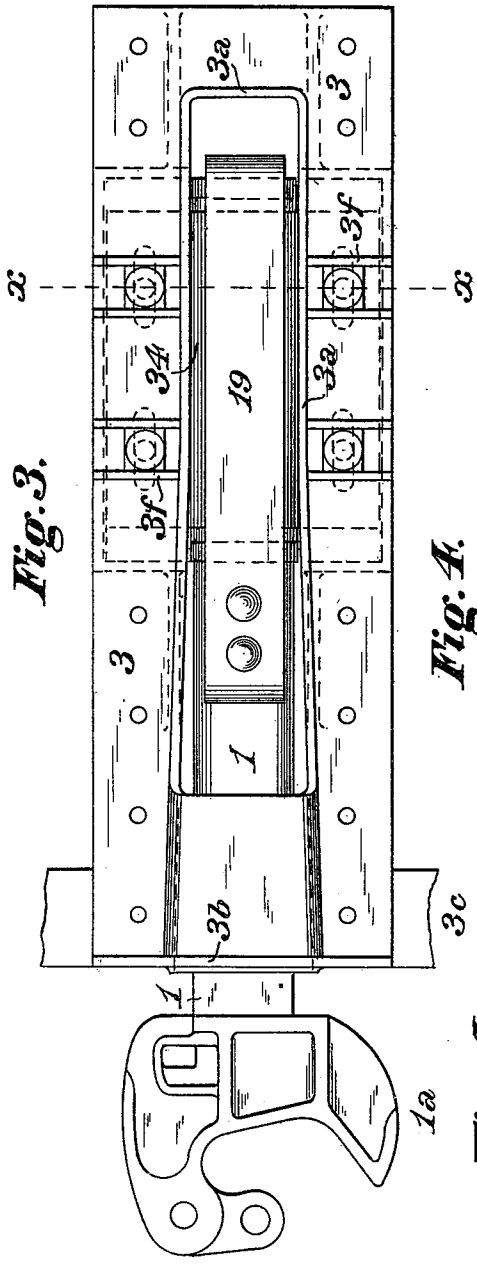


Fig. 5.

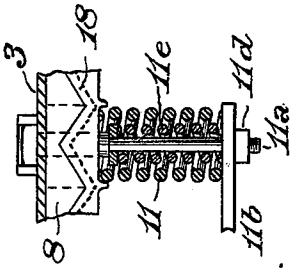


Fig. 4.

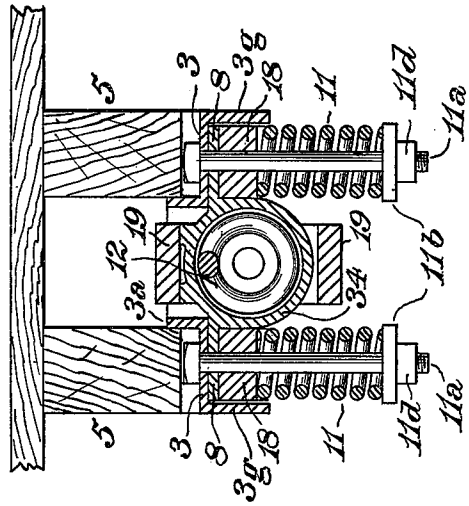
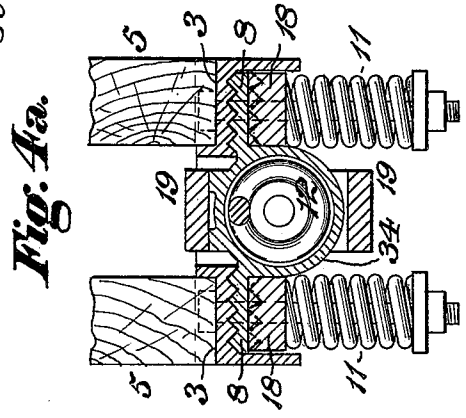


Fig. 4a.



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DRAW GEAR AND BUFFING APPARATUS.

(Application filed Aug. 18, 1900.)

(No Model.) 4 Sheets—Sheet 3.

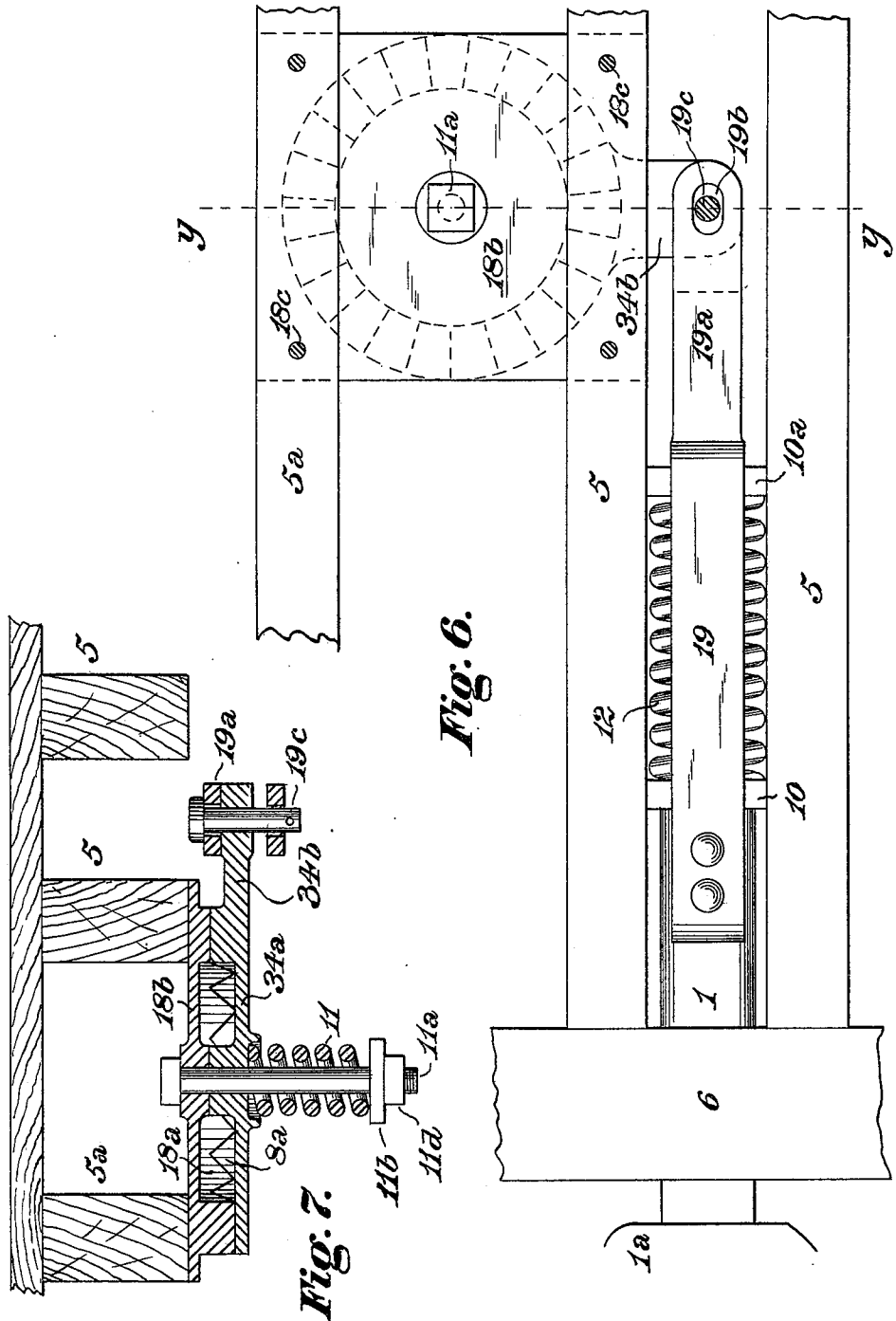

Fig. 6.

Fig. 7.

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(Application filed Aug. 18, 1900.)

(No Model.) 4 Sheets—Sheet 4.

Fig. 8.

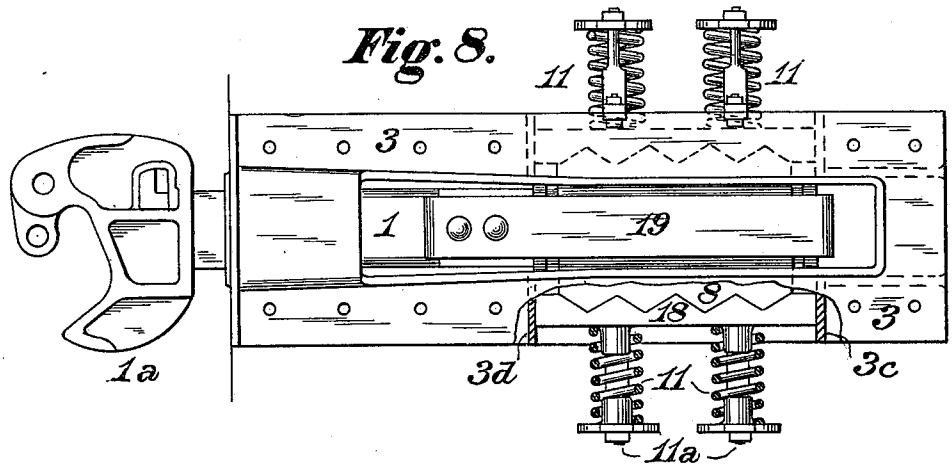
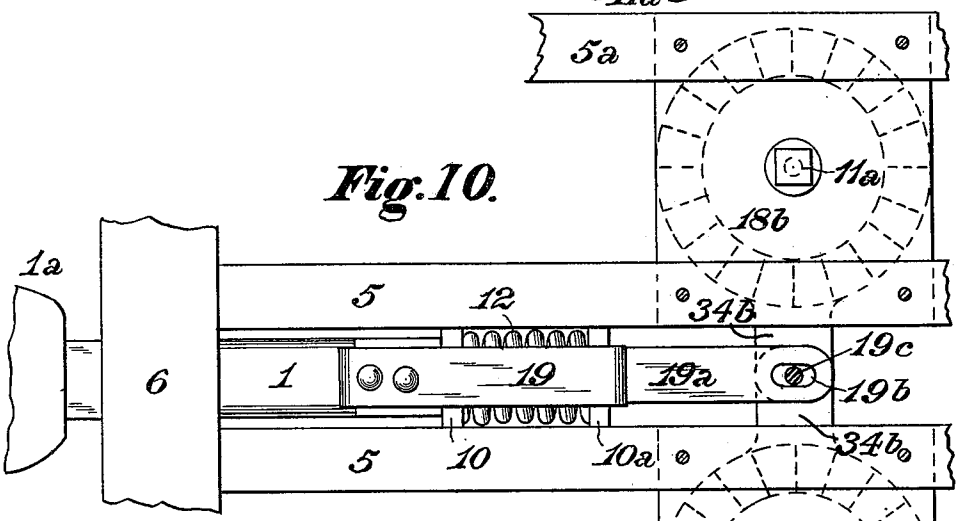


Fig. 10.



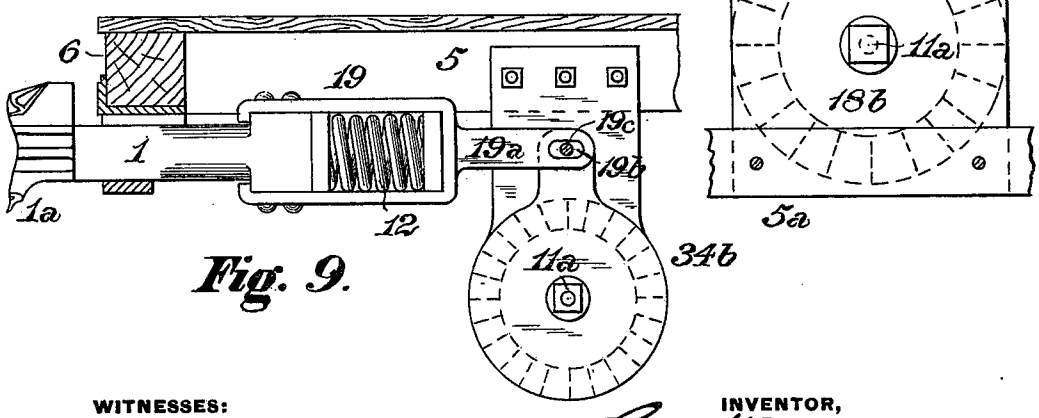


Fig. 9.

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UNITED STATES PATENT OFFICE.

GEORGE WESTINGHOUSE, OF PITTSBURG, PENNSYLVANIA.

DRAW-GEAR AND BUFFING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 672,116, dated April 16, 1901.

Application filed August 18, 1900. Serial No. 27,282. (No model.)

To all whom it may concern:

Be it known that I, GEORGE WESTINGHOUSE, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a certain new and useful Improvement in Draw-Gear and Buffing Apparatus, of which improvement the following is a specification.

My present invention relates to and is an improvement in draw-gear and buffing apparatus for railroad-vehicles of the general class or type set forth in Letters Patent of the United States No. 649,187, granted and issued to me under date of May 8, 1900—that is to say, that in which the draw-bar is combined with a preliminary or initial resistance element having a reactionary capacity, an independent secondary resistance element, the action of which is exerted independently of and supplementally to that of the initial resistance element, and connections through which the movement of the draw-bar in either direction under the application of strain imparts such strain, when sufficiently great, to the secondary resistance element.

The object of my invention is to simplify and economize the construction of draft and buffing appliances of the class above specified by the provision of novel and improved means for the attachment and support thereof to and upon a car and the effective exertion of a frictional secondary or final resistance, the detailed members of which and their combined operative relation shall be such as to enable a substantial reduction in the number of parts to be made and the expense and delay of machine-work to be avoided.

The improvement claimed is hereinafter fully set forth.

In the accompanying drawings, Figure 1 is a vertical longitudinal section through the central plane of a draft and buffing apparatus, illustrating an application of my invention; Fig. 2, a similar section taken in a plane adjoining one of the side flanges of the supporting-plate; Fig. 3, a plan or top view; Fig. 4, a transverse section at the line $x\ x$ of Fig. 3; Fig. 4^a, a similar section illustrating means for increasing the area of frictional surface; Fig. 5, a view, partly in elevation and partly in section, illustrating an auxiliary spring applied for increasing frictional resistance; Fig. 6, a plan or top view of a structural modification of my invention; Fig. 7, a transverse section through the same at the line $y\ y$ of Fig. 6; Fig. 8, a plan view showing the resistance members as abutting in vertical planes; Fig. 9, a side view showing the resistance members of Figs. 6 and 7 as disposed vertically instead of horizontally, and Fig. 10 a plan view showing the resistance members of Figs. 6 and 7 as duplicated.

In the practice of my invention a draw-bar 1, provided with a suitable coupling-head 1^a, is fitted to traverse longitudinally below or between the center sills 5 of the frame of a car or other railroad-vehicle, at each end thereof, or, if preferred, between draft timbers or draw-gear supports of any suitable and approved construction, the outer end of the draw-bar and the connected coupling-head projecting, as usual, beyond the end sill 6.

Tractive force and strains of draft and buffing applied to the draw-bar 1 are transmitted therefrom to the car-frame through a resistance mechanism presently to be described, which is held in operative relation to the draw-bar and the car-frame by a supporting-plate 3, secured by bolts 4 to the center sills 5. A central longitudinal opening is formed in the supporting-plate 3 for the major portion of its length to admit of the traverse of a U-shaped draft-strap 19, which is secured to the inner end of the draw-bar, and an upwardly-extending flange 3^b, which abuts against the outside of the end sill 6, is formed on the adjacent end of the supporting-plate. Strains of draft are imparted to the supporting-plate and thence to the car-frame through front draw-bar stops 3^d, which are located on opposite sides of the central opening of the supporting-plate and are preferably made integral with said plate, and buffing strains are taken by the car-frame through similar back draw-bar stops 3^e, located at a proper distance from the rear of the supporting-plate. Downwardly-projecting strengthening-flanges 3^g are formed upon the side of the supporting-plate, extending from one draw-bar stop to the other and in position to cover and protect the frictional members of the appliance from the access of dirt and grit. The outer end of the draw-bar is supported by a strap or carry iron 3^c, bolted to the supporting-plate 3 and end sill 6.

Preliminary strains and those which are of comparatively minor force and extent are, as in my Letters Patent No. 649,187 aforesaid, opposed and counteracted, both in draft and

buffing, by a preliminary resistance element, shown in the form of two helical springs 12, which are inclosed in and supported by a cylindrical open-ended carrier-housing 34, fitting freely within the draft-strap 19. The inner ends of the springs 12 abut against an inner annular flange on the carrier 34, and their outer ends bear on front and back followers 10 10^a, which abut, respectively, against the inner end of the draw-bar 1 and the rear vertical portion of the draft-strap 19. All strains within the capacity of resistance of the springs 12 are transmitted to the front or the back draw-bar stops, as the case may be, through one or the other of the followers 10 10^a.

Strains of draft and buffing which are in excess of the capacity of the preliminary resistance-springs 12 are opposed and counteracted by a secondary frictional resistance element, which, as in Letters Patent No. 649,187 aforesaid, is inactive during the compression of the springs 12 and which acts subsequently and supplementally thereto. In the form of my invention which is herein illustrated the frictional resistance element comprises two friction-blocks 8, which are formed integral with or secured to the sides of the carrier 34, two friction-blocks 18, abutting against the friction-blocks 8, and springs 11, by which the friction-blocks 8 and 18 are held in contact with such force as will induce the proper and desired degree of frictional resistance to their relative movement. The abutting faces of the friction-blocks 8 and 18 are in the form of a plurality of inclines extending in alternately-reversed directions, as clearly shown in Figs. 2 and 8, so as to present an integral wedge-face substantially throughout the entire length of the carrier on each of its sides and enable the spring-resistance to be distributed and exerted at different points in the length of the friction-blocks and to render the friction-blocks operative in either direction of movement of the draw-bar and carrier. The friction-blocks 8, fixed to the carrier 34, are adapted to be moved longitudinally by and with the draw-bar between the front and the back draw-bar stops 3^d 3^e without contacting with said stops, the length of the blocks 8 being less than the distance between the inner faces of the stops, while the friction-blocks 18 abut at their ends against said stops, and consequently have the capacity of movement only at right angles to the traverse of the friction-blocks 8.

Instead of providing draw-bar stops in pairs with one member located at and fitting against each end of the wedge-block 18, as above described, the function thereof could be similarly performed by a single draw-bar stop fixed to the supporting-plate 3 and interposed between the ends of the wedge-block, as at or near its central portion, and having front and rear bearing-faces to abut against corresponding faces on the wedge-block. This construction I therefore specify as the mechanical equivalent of a wedge-block interposed between end draw-bar stops. It will also be seen that, if desired, the spring-bolts 11^a may perform the function of draw-bar stops, as well as that of connecting the abutting wedge-blocks and supporting the seats of the springs 11.

The springs 11 bear on the outer faces of the friction-blocks 18 and at their opposite ends on spring seats or plates 11^b, which are held, as by nuts 11^d, on the outer ends of spring-bolts 11^a. The bolts 11^a fit freely in the friction-blocks 18, so as to permit the latter to traverse in the direction of the axes of the bolts and pass through longitudinally-slotted openings in the friction-blocks 8, as indicated by dotted lines in Figs. 2 and 3, in order to admit of the longitudinal traverse of the blocks 8 with the draw-bar. The heads of the bolts 11^a bear on the top of the supporting-plate 3, and the bolts are held against rotation by stops 3^f on said plate. As shown in Figs. 2 and 3, sufficient clearance is left between the ends of the carrier 34 and the adjacent followers 10 10^a to permit the draw-bar to traverse in either direction sufficiently far to fully compress the preliminary springs 12 before inducing the exertion of frictional resistance. After the exertion of frictional resistance in either direction the interlocked friction-blocks 8 and 18 will be released and returned to normal position with promptness and certainty by the movement of the draw-bar in the opposite direction.

It will be obvious to those skilled in the art that the relative positions of the friction-blocks 8 and 18 may, if desired, be reversed without departure from the spirit or operative principle of my invention—that is to say, the inclined or wedge faces of the friction-blocks 8 of the carrier may be turned upwardly and the friction-blocks 18 and springs 11 be located above them. It will also be apparent that the friction-blocks may, as shown in Fig. 8, abut vertically instead of horizontally, if preferred, as the same structural and operative relation of the several members would in such case be preserved, and the traverse of the friction-blocks 18 would be effected in a horizontal instead of in vertical planes. Again, if desired, the extent of surfaces in frictional contact may be further increased by forming inclined faces upon the upper sides of the friction-blocks 8 and corresponding faces on the abutting portions of the supporting-plate 3, as shown in Fig. 4^a. Similarly the area of the frictional contact-surfaces of the friction-blocks 8 and 18 may be increased by forming interlocking inclines on their abutting faces, as indicated in dotted lines in Figs. 4^a and 5.

Fig. 5 illustrates means for increasing frictional resistance by the application of auxiliary springs 11^e, which are coiled within the main springs 11 of the friction-blocks and are brought into action by the continued downward traverse of the friction-blocks 18

after an initial compression of the main springs 11. The amount of frictional resistance can thus be made to meet all requirements by the application of a sufficient spring-resistance.

Figs. 6 and 7 exemplify a structural modification in which movements of partial rotation instead of reciprocating movements are imparted by the draw-bar to a frictional resistance member. The preliminary resistance element is in this case a helical spring 12, bearing on followers 10 10^a, which are located within the draft-strap 19, similarly to the followers first described, and abut against suitable front and back draw-bar stops, (not shown,) which are secured to the center sills 5. A rearward extension 19^a, having a longitudinal slot 19^b near its rear end, is formed upon or secured to the draft-strap 19, and said extension is coupled by a pin or bolt 19^c, passing through the slot 19^b, to a radial arm 34^b on a carrier plate or disk 34^a, which is pivoted by a spring-bolt 11^a to a plate or disk 18^b, secured to one of the center sills 5 and the adjacent intermediate sill 5^a by bolts 18^c. A friction-block 8^a in the form of a circular series of projections having oppositely-inclined or wedging faces is formed on the carrier-plate 34^a, and a similar friction-block 18^a is formed on the adjacent face of the plate 18^b. The spring-bolt 11^a passes freely through the carrier-plate 34^a, and the friction-blocks 8^a 18^a are maintained in contact by a spring 11, which, as in the instance first described, induces the proper degree of frictional resistance to their relative movement. The slot 19^b in the extension 19^a of the draft-strap admits of the range of traverse of the draw-bar to the limit of compression of the preliminary resistance element 12, the frictional members remaining inactive, subsequently to which compression movement of the draw-bar in either direction is opposed by the resistance of the friction-blocks 8^a 18^a, preliminary and secondary resistance being thus independently and successively exerted, as in the instance first described. A sufficient space is left in the jaw of the draft-strap extension 19^a, as shown in Fig. 7, to admit of the downward movement of the carrier-plate 34^a when turned upon its pivot without imparting any downward strain to the draft-strap or its connections.

Various modifications in structure and detail of the construction shown in Figs. 6 and 7 may without variation of operative principle or essential elements be readily made by the skilled mechanic. Thus, for example, the plates 34^a 18^b may be disposed vertically instead of horizontally, as shown in Fig. 9. Again, the frictional resistance mechanism may be duplicated—that is to say, a fixed and a movable frictional resistance member may be located on each side of the draft-strap extension 19^a, as shown in Fig. 10—the two movable members being coupled thereto, as in the construction shown in Figs. 6 and 7.

While a preliminary resistance element is herein illustrated and is preferably employed in practice, the features of my invention which relate specifically to the secondary resistance element may be applied without the preliminary spring—as, for example, in stationary buffer-stops. It will be obvious that in such case it will be unnecessary to provide the central portion of the carrier with a tubular spring-receptacle or to inclose it in a draft-strap, as in the embodiment of the invention shown in the drawings, as the carrier could then be connected directly to and form an inward extension of the draw-bar, having the longitudinally-moving friction-blocks formed upon or fixed to it, as in the instance shown.

My invention attains in practice the substantial advantage of enabling any desired degree of frictional resistance to be exerted in opposition to draw-bar strains under a construction which is readily and conveniently applicable in connection with car-frames of any of the ordinary designs now in service which is simple, strong, and compact and in which a material economy is effected by a considerable reduction in the number of parts employed as compared with prior appliances and the avoidance of the necessity of machining the working parts.

I claim as my invention and desire to secure by Letters Patent—

1. In a draw-gear or buffing apparatus, the combination of a draw-bar, a preliminary spring subject to compression by the movement thereof, a carrier coupled to the draw-bar and movable by and in the direction of the traverse thereof subsequent to compression of the preliminary spring, a friction-block having an inclined or wedging face and fixed laterally to the carrier, a friction-block having a corresponding wedging face abutting against the wedging face of the carrier friction-block, means for permitting movement of one of said friction-blocks at right angles to the other, and means for maintaining said friction-blocks in contact to impart frictional resistance to the movement of the draw-bar and carrier.

2. In a draw-gear or buffing apparatus, the combination of a draw-bar, a preliminary spring subject to compression by the movement thereof, a carrier coupled to the draw-bar and movable by the traverse thereof subsequent to compression of the preliminary spring, a friction-block having an inclined or wedging face and fixed to the carrier, a friction-block having a corresponding wedging face abutting against the wedging face of the carrier friction-block, a spring-bolt connecting said friction-blocks with the capacity of movement of one of them at right angles to the other, and a spring abutting against one of said friction-blocks and against a bearing on the spring-bolt.

3. In a draw-gear or buffing apparatus, the combination of a draw-bar, a carrier coupled thereto and movable by traverse thereof, a

friction-block having a longitudinal integral wedging face formed of a plurality of alternately-reversed inclines and fixed laterally to the carrier, a second friction-block having a longitudinal wedging face corresponding with and abutting against the wedging face of the carrier friction-block, and fitted to traverse at right angles thereto, a fixed stop or abutment constituting an end bearing for said second friction-block, and a spring for maintaining said friction-blocks in contact to impart frictional resistance to the movement of the draw-bar and carrier.

4. In a draw-gear or buffing apparatus, the combination of a draw-bar and a carrier coupled to the inner end of said draw-bar, and having, on each of its sides, an integral friction-block, the working face of which is formed of a plurality of pairs of alternately-reversed inclines, and the opposite face of which is adapted to be subjected to the application of spring-resistance at two or more points in its length.

5. In a draw-gear or buffing apparatus, the combination of a draw-bar, a carrier coupled thereto and movable by traverse thereof, friction-blocks having longitudinal integral wedging faces formed of a plurality of alternately-reversed inclines and fixed to opposite sides of the carrier, pairs of stops fixed to the frame on which the draw-bar is supported, friction-blocks, each having a longitudinal wedging face corresponding with and abutting against the wedging face of one of the carrier friction-blocks, and fitted to traverse between the members of a pair of frame-stops, at right angles to the traverse of the draw-bar and carrier, and a plurality of springs bearing on said last-stated friction-blocks at different points in their length and on fixed abutments.

6. In a draw-gear or buffing apparatus, the combinatiou of a draw-bar, a draft-strap connected thereto, followers fitted in said draft-strap, a tnbular carrier interposed between said followers, with the capacity of limited relative movement, a preliminary spring inclosed in the carrier and bearing against the followers, a friction-block having an inclined or wedging face and fixed to the carrier, fixed draw-bar stops forming abutments for the followers, a friction-block having a wedging face corresponding with and abutting against the wedging face of the carrier friction-block, and fitted to traverse at right angles thereto between the draw-bar stops as end abutments, and a spring which maintains the friction-blocks in contact to impart frictional resistance to the movements of the draw-bar and carrier.

7. In a draw-gear or buffing apparatus, the combination of a supporting-plate adapted to be connected to a car-frame and centrally recessed to admit a draw-bar and its connections, pairs of draw-bar stops fixed on said supporting-plate at opposite sides of its central recess, a draw-bar, a carrier coupled thereto and adapted to traverse longitudinally therewith in the recess of the supporting-plate, friction-blocks, fixed to opposite sides of the carrier, each having a plane face abutting against the supporting-plate and an opposite inclined or wedging face, friction-blocks, each fitting at its ends between the members of a pair of draw-bar stops, and having an inclined or wedging face corresponding with and abutting against the wedging face of one of the carrier friction-blocks, and springs bearing on each pair of friction-blocks and on stops fixed to the supporting-plate.

8. In a draw-gear or buffing apparatus, the combination of a supporting-plate adapted to be connected to a car-frame and centrally recessed to admit a draw-bar and its connections, pairs of draw-bar stops fixed on said supporting-plate at opposite sides of its central recess, a draw-bar, a carrier coupled thereto and adapted to traverse longitudinally therewith in the recess of the supporting-plate, friction-blocks, fixed to opposite sides of the carrier, each having a plane face abutting against the supporting-plate and an opposite inclined or wedging face, friction-blocks, each fitting at its ends between the members of a pair of draw-bar stops and having an inclined or wedging face corresponding with and abutting against the wedging face of one of the carrier friction-blocks, springs bearing on each pair of friction-blocks and on stops fixed to the supporting-plate, and strengthening side flanges on the supporting-plate which also cover and protect the outer faces of each pair of friction-blocks.

9. In a draw-gear or buffing apparatus, the combination of a draw-bar, a draft-strap coupled thereto, a tubular carrier fitting in and movable by the draft-strap and adapted to receive a preliminary spring, and friction-blocks fixed to opposite sides of the carrier and provided with longitudinal inclined or wedging faces.

10. In a draw-gear or buffing apparatus, the combination of a supporting-plate adapted to be connected to a car-frame and having a longitudinal central recess, a draw-bar, a carrier coupled thereto and movable thereby in the recess of the supporting-plate, friction-blocks fixed to opposite sides of the carrier and having inclined or wedging faces, friction-blocks, each having an inclined or wedging face corresponding with and abutting against the wedging face of one of the carrier friction-blocks, springs bearing on the friction blocks and maintaining them in contact one with the other, and with the adjacent faces of the supporting-plate, and a strap or carry-iron fixed to the supporting-plate and supporting the draw-bar adjacent to its outer end.

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