R. D. GALLAGHER, Jr.

BUFFING MECHANISM FOR PASSENGER CARS.

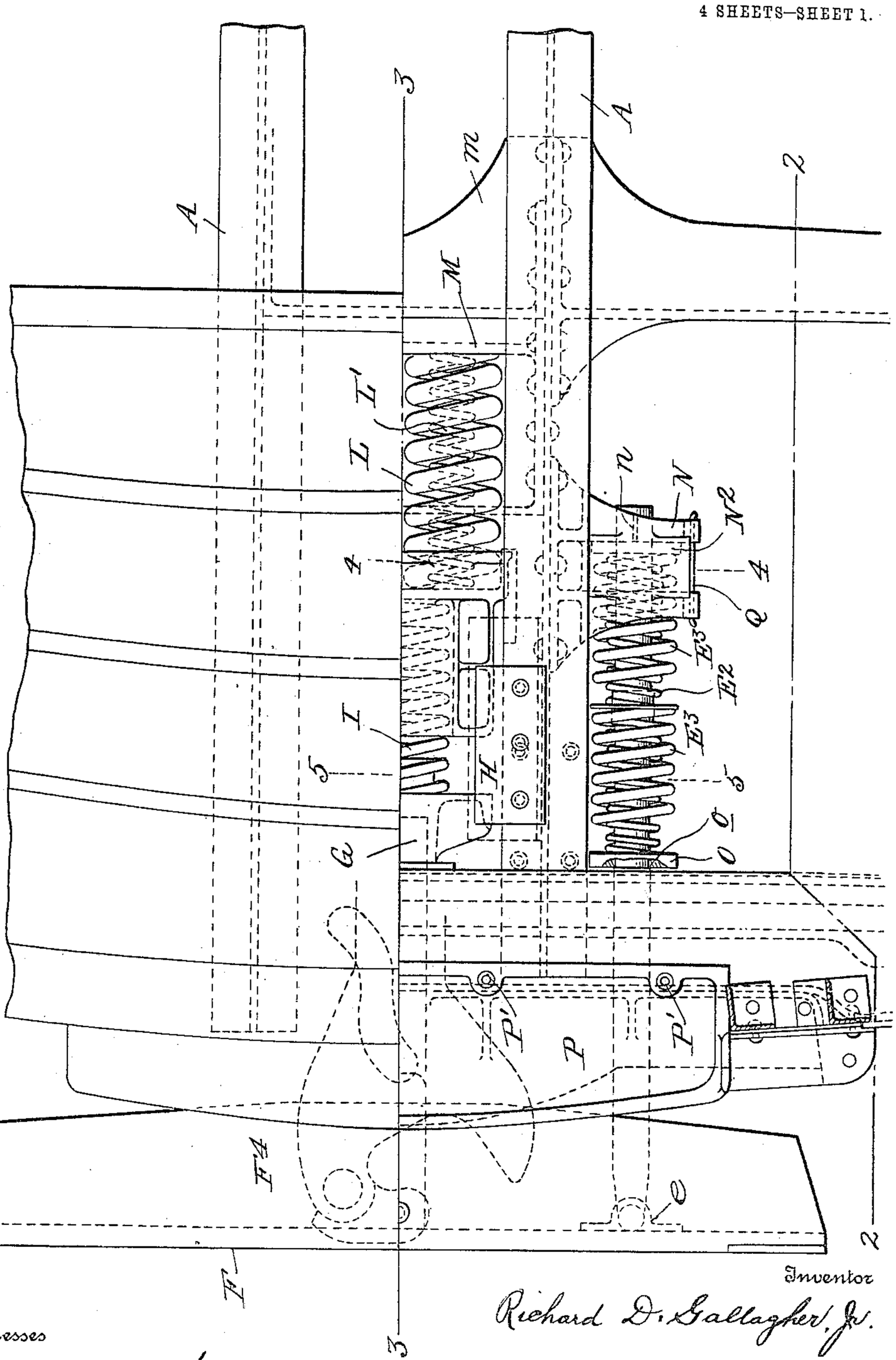
APPLICATION FILED JAN. 28, 1909.

975,945.

Patented Nov. 15, 1910.

4 SHEETS—SHEET 1.

Fig. 1.



Witnesses

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4 SHEETS—SHEET 2.

Fig. 3.

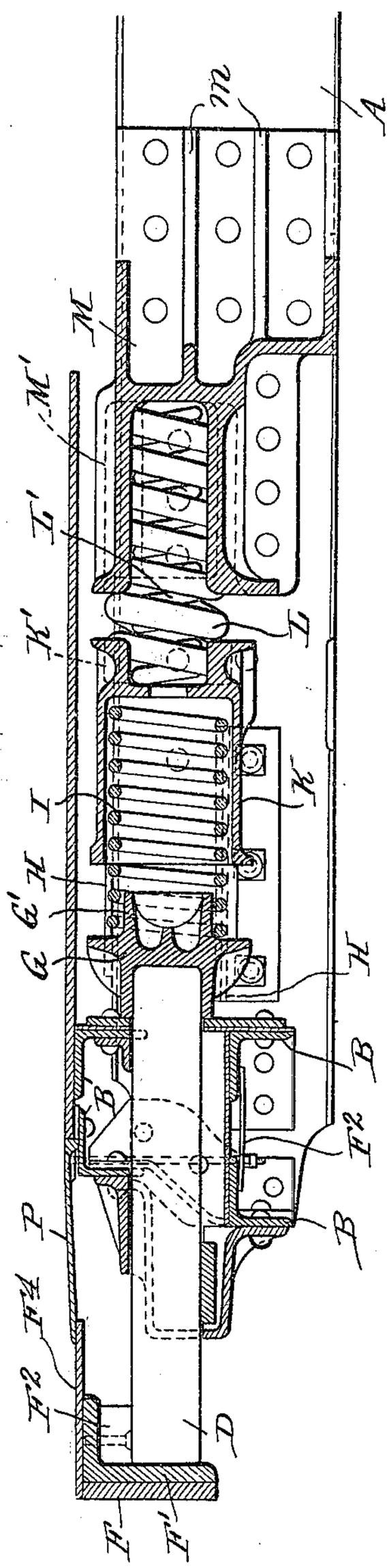
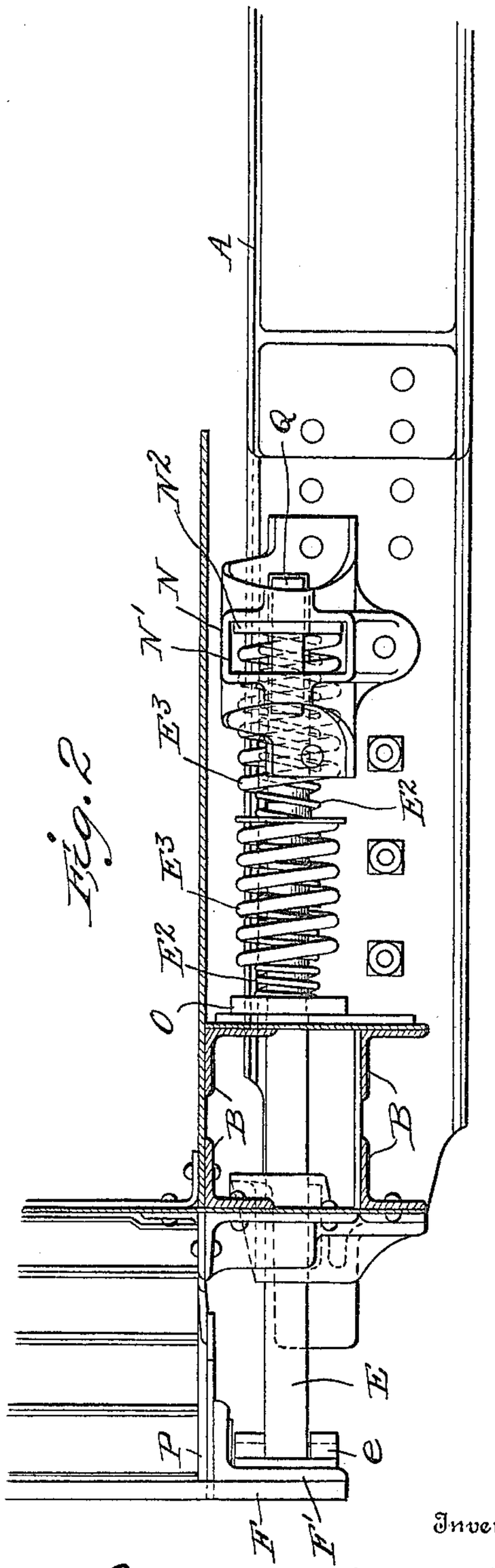


Fig. 2



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4 SHEETS—SHEET 3.

Fig. 5.

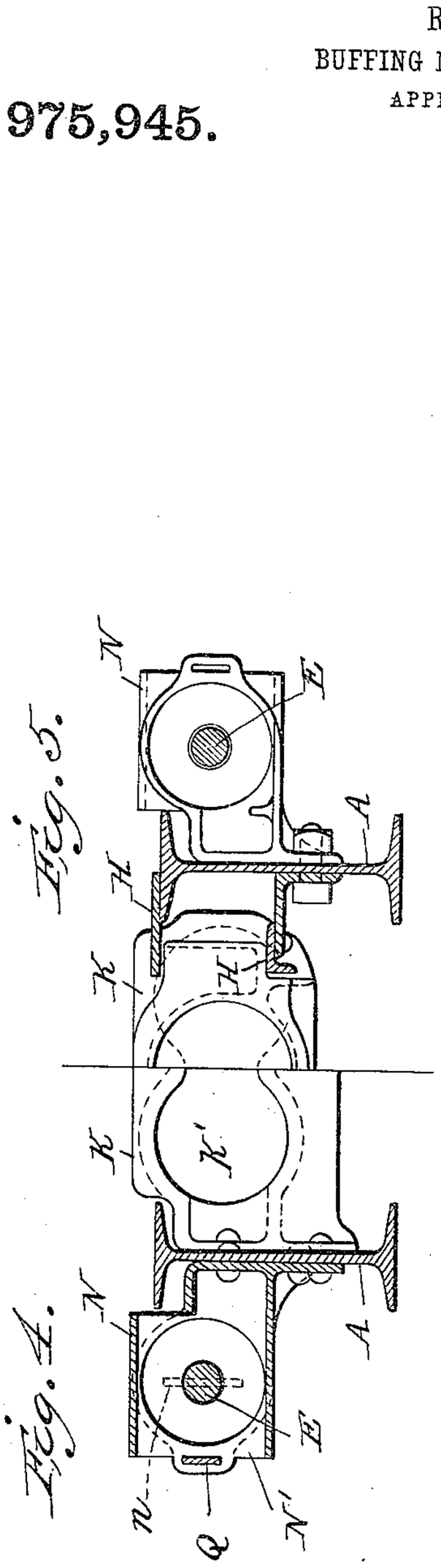
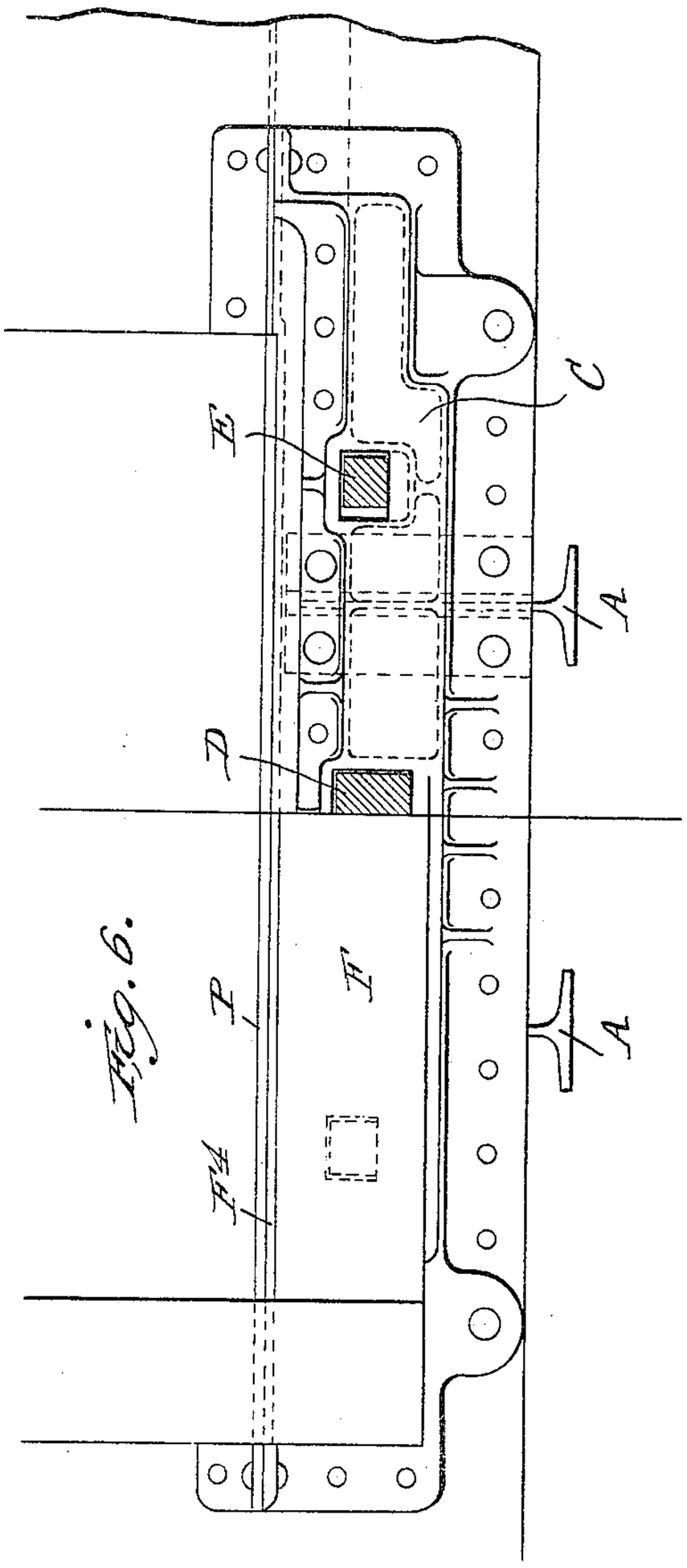


Fig. 4.

Fig. 6.



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4 SHEETS—SHEET 4.

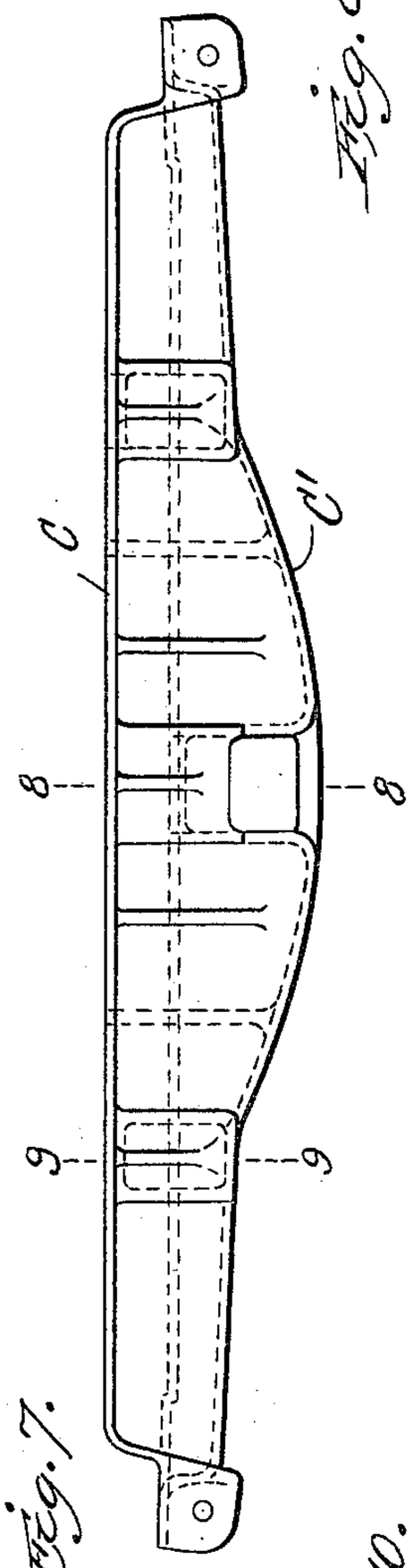

Fig. 7.

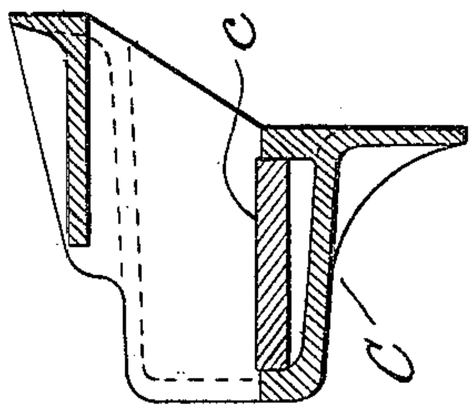

Fig. 8.

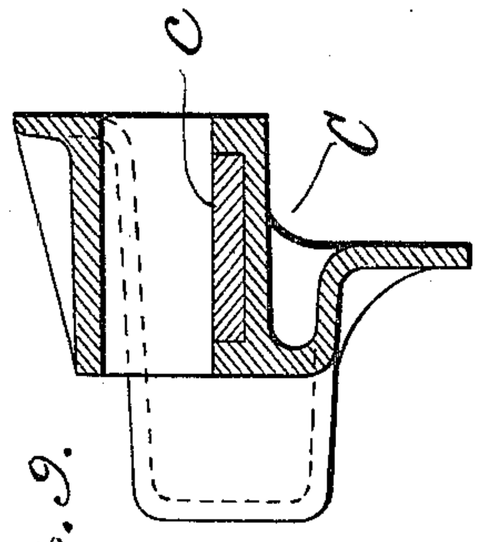

Fig. 9.

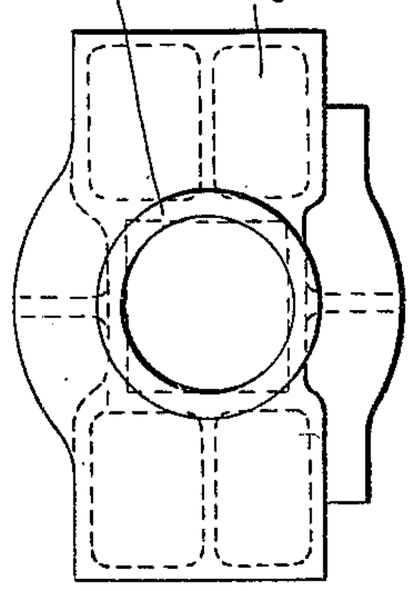

Fig. 10.

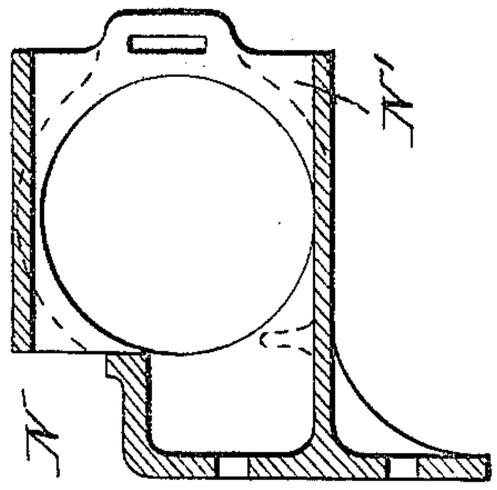

Fig. 13.

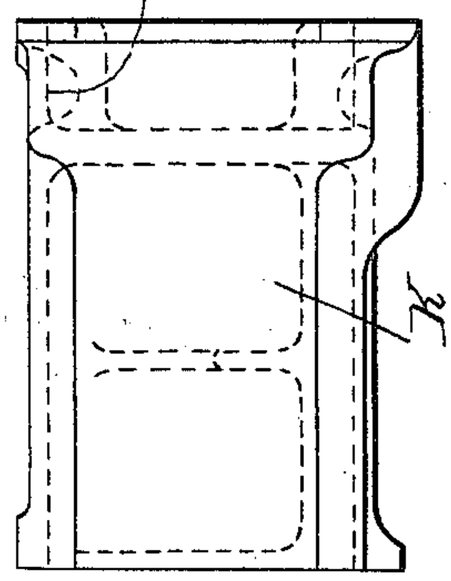

Fig. 12.

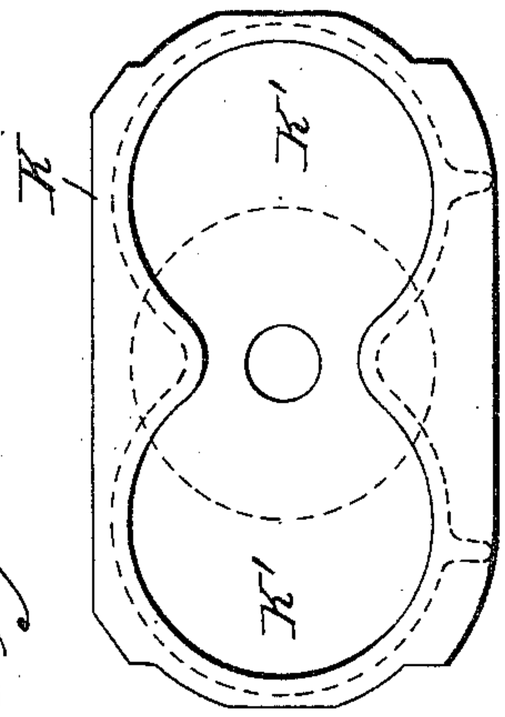

Fig. 11.

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UNITED STATES PATENT OFFICE.

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BUFFING MECHANISM FOR PASSENGER-CARS.

975,945. Specification of Letters Patent. Patented Nov. 15, 1910.

Application filed January 23, 1909. Serial No. 474,768.

To all whom it may concern:

Be it known that I, RICHARD D. GALLAGHER, Jr., a citizen of the United States, residing in the city, county, and State of New York, have invented certain new and useful Improvements in Buffing Mechanism for Passenger-Cars; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the figures and letters of reference marked thereon.

This invention relates to that type of buffing mechanism particularly adapted for passenger cars, the object of the invention being to provide a practical and convenient arrangement of the parts whereby the buffer is permitted an easy resilient movement to the point of coupling, when the yielding resistance to further movement is considerably increased in order to absorb the shock due to coupling, without imparting the shock to the body of the car.

A further object of the invention is to provide a structure of such construction that parts may be removed without taking down the entire structure, whereby the substitution of springs and minor parts may be effected without great labor or inconvenience.

A further object of the invention is to provide a structure which will readily conform to the movements of the car bodies in passing around curves, and at the same time maintain a relatively wide platform bridge between the cars, upon which the vestibule bellows frame may be erected and maintained in proper alinement.

Referring to the accompanying drawings: Figure 1 is a top plan view of a portion of one end of a car, one-half being in sectional plan to illustrate the mechanism and parts embodying the present improvements. Fig. 2 is a sectional elevation taken on the line 2—2 of Fig. 1. Fig. 3 is a vertical central longitudinal section through a platform and buffing mechanism, substantially on the line 3—3, Fig. 1. Fig. 4 is a transverse section showing the parts on one side of the center in a plane indicated by the line 4—4 of Fig. 1, omitting the flooring and all parts above the same. Fig. 5 is a similar section on the line 5—5 of Fig. 1, Figs. 4 and 5 both omitting the springs in order that the parts with which the springs coöperate may be more clearly illustrated. Fig. 6 is a front elevation of the buffer and buffer beam extension, one-half of the buffer being broken away in order to show the extension in elevation. Fig. 7 is a plan view of the buffer beam extension detached. Fig. 8 is a section on the line 8—8, Fig. 7. Fig. 9 is a section on the line 9—9, Fig 7. Fig. 10 is a rear elevation of the buffer spring follower, shown in section in Fig. 3. Fig. 11 is a rear elevation, and Fig. 12 a side elevation of the buffer spring casing shown in front elevation in Fig. 5. Fig. 13 is a vertical section through the side stem bracket shown in top plan in Fig. 1, and in side elevation in Fig. 2.

In the embodiment of the invention illustrated in the drawings, the buffer mechanism is combined with or embodied in a construction from which wood is excluded as far as practicable. In other words, the buffing mechanism is embodied in a metal platform and car frame, thus the platform timbers A—A are in the form of I-beams which may extend, if so desired, from end to end of the car, as has been heretofore proposed. At their extremities, the I-beams A support or have built around them the buffer beam or platform end sill which, in the present instance, is formed of suitable transversely extending plates and L-beams B, secured by bolts and angle irons between and to the platform timbers in any suitable or preferred manner. In addition, the said buffer beam or platform end sill is provided with a front extension in the form of an integral casting C, Fig. 7, which I shall herein designate as the buffer beam extension. The buffer beam and buffer beam extension are provided with bearings or apertures for the passage of the center and side stems D and E, respectively, the bearings in the extension being of such character as to support said stems in their horizontal position and at the same time permit them to move in and out or longitudinally without cramping or binding. The preferred arrangement of the top and bottom bearing surfaces is well illustrated in the sectional views, Figs. 8 and 9, wherein it will be seen that each bearing is provided with a bottom wear plate *c*,

of considerable area, and in said figures it will be seen that the bearing for the center stem projects beyond the bearings for the side stems, thereby providing for a greater range of movement of the said stems, and at the same time permitting the buffer beam extension to be formed with an arc-shaped front contour line at the center, as at C′ in Fig. 7, around which the buffer may rock to a limited extent, as will be hereinafter explained. The width and construction of the buffer beam extension are such that it may be conveniently formed in a single casting of relatively light weight but great strength owing to the incorporation therein of suitable transverse and longitudinal webs and flanges, as will be readily understood from an inspection of Figs. 6, 7, 8 and 9.

The center stem D, which is preferably rectangular in cross section, is adapted at its forward end to centrally support the buffer F, the angle F′ of the buffer being centrally provided with a chafing plate F^2 resting on the upper side of the center stem. At its inner end the center stem projects through the buffer beam, and is seated or received within a socket formed on the front of the buffer spring follower G. The follower G is supported at the edges by, and is adapted to slide between, guide plates H, carried by the platform timbers or I-beams A, and on its rear face it is provided with a boss or projection G′ around which the forward end of the single coil or preliminary buffer spring I finds its seat.

The body of the preliminary buffer spring I is adapted to lie within a buffer spring casing K, Figs. 3, 11 and 12, and said casing is itself supported upon and between the guide plates H before referred to so as to be capable of longitudinal movement thereon. Sufficient play is provided between the forward end of the casing and rear face of the buffer spring follower to give the necessary or desired range of soft or preliminary spring action, but at the same time said parts seat or come together when resisting the heavier strains or shocks after the couplings between the cars have moved into engagement.

Inward movement of the buffer spring casing is resisted by relatively heavy springs adapted to absorb heavy shocks without permitting the same to materially affect the car body, and as a convenient arrangement twin double coiled springs L and L′ are interposed between the inner face of the buffer spring casing and a bridge or cross piece bolted or riveted solidly between the proximate faces of the platform timbers or I-beams A. This bridge or cross piece, as shown in the accompanying drawings, is preferably in the form of a casting M, having strengthening webs and flanges *m*, and on its outer face two spring pockets or chambers M′ in which the major portion of the main buffer springs may be concealed. The forwardly projecting portions of the main buffer springs extend into corresponding chambers or seats K′, Fig. 11, in the rear face of the buffer spring casing, and in the preferred arrangement the rear face of the buffer spring casing and front face of the cross piece are adapted to contact and form final stops when the pressure becomes greater than that designed to be taken up by the elastic resistance of the main springs.

From the foregoing it will be seen that when the elastic resistance of all of the springs has been overcome, the center stem will, through its follower, the buffer spring casing and the bridge or cross piece, be solidly seated, and further pressure will be transmitted directly to the car frame, thus providing for a maximum resisting power to abnormal or excessive shocks, such as might be encountered by collisions, or otherwise, and without liability of breaking the springs or causing them to become set. In passing around curves, the buffer F is adapted to rock more or less on the front end of the center stem D, and in order to afford additional resistance to its inward movement, as well as to return the same to its normal transverse position, when released from unequal pressure, and to check its outward movement, each side stem E is pivotally connected with the inner side of the buffer, preferably by a T-head and hinged plate *e*, Fig. 2, and means are provided whereby the side stems will afford a yielding resistance to the movement of the buffer, either inwardly or outwardly, thus a rocking movement of the buffer on the center stem is resisted by the combined action of the side stems, one opposing the outward movement of one end of the buffer and the other opposing the inward movement of the opposite end of the buffer.

As a preferred construction, the platform timbers or I-beams are provided with laterally projecting side stem brackets N, Figs. 1, 2 and 13, into which the rear ends of the side stems E and side stem springs E^2, E^3 may project. The side stem brackets are, however, provided with central chambers preferably substantially rectangular and indicated at N′ in Fig. 2, for the reception of side stem followers N^2, which followers N^2 are permitted a movement equal to the width of the chamber N′, but are adapted to be arrested and held against further movement in either direction by the walls of the bracket. Keys indicated at *n* in Fig. 1 serve to prevent the withdrawal of the side stems through the followers, and the followers serve as the plates against which the side stem springs abut. At their forward ends the side stem springs are adapted to abut against side stem washers O, preferably

seated and held against forward movement on the side stems by suitable shoulders *o* on the stems themselves, as will be readily understood, but adapted to permit the stems to move forwardly when the washers contact with and rest against the rear face of the buffer beam.

The springs for the side stems are preferably double coiled springs, that is to say, there is an inner spring E^2 of relatively small diameter and an outer spring E^3 of larger diameter, and inasmuch as it is preferred that a preliminary soft resistance shall be offered to the inward movement of the buffer by the side springs, as well as by the center springs, the outer coils of the side springs are preferably shorter than the coils of the inner spring, and in fact for convenience and to enable commercial springs to be employed, the outer springs may be made in a plurality of separate coils E^3, as shown in Fig. 1, the combined length of the outer springs being such that they will not come into action to offer effective resistance to the inward movement of the buffer until said buffer has been moved sufficiently far to permit of the cars being coupled together, but after which time the heavy side springs, together with the heavy or main center springs, will combine in their action to offer greatly augmented elastic resistance to further inward movement of the buffer.

The threshold plate F^4 secured to the top of the buffer is somewhat wider at the center than at the ends, and is adapted to pass beneath and support the front edge of the name plate P, which latter forms a bridge between the threshold plate and platform, but permits the threshold plate and buffer to move freely beneath the same. The name plate P is secured at its rear edge to the buffer beam by bolts P′, having their heads countersunk in the face of the name plate and extending down through the buffer beam and through flat springs P^2, which springs exert a constant tendency to hold the name plate down to its seat on the platform and with its outer edge in close sliding contact with the threshold plate, whereby the proper relation of the parts will be maintained even though the buffer be moved or shifted either during the coupling up of the cars or due to train movements when the cars are under way.

In operation, the preliminary inward movement of the buffer is yieldingly resisted solely by the preliminary main buffer spring at the center and by the inner and lighter coils of the side stem springs, and without throwing abnormal strain on the said preliminary springs the final or main buffing springs are brought into action to resist the final shocks. While the parts may be arranged to permit of a practically independent action of the preliminary springs in absorbing the shocks incident to ordinary travel, as, for instance when a train is under way, it is preferred that the preliminary spring action shall practically cease when the cars have been coupled together, and that after the coupling has been effected, any further movement shall be resisted by the main and more powerful buffing springs, the train being thereby held more closely together or in a solid unit than would otherwise be the case.

With the construction described, it is possible to remove individual units of the buffing mechanism and substitute others without dismantling the whole of the mechanism, and in this connection it may be noted that the side stem followers are retained in their chambers by keys Q passed through suitable openings in the projecting portions of the side stem brackets, whereby the side stem springs may be removed without removing the center stem.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In buffing mechanism, the combination with the buffer, the center stem coöperating therewith for holding the buffer projected and the center stem follower with which the rear end of the center stem coöperates, of a relatively light spring bearing at one end against said follower, a pair of relatively heavy main springs in rear of the light spring, a floating casing interposed between the light and heavy springs and having walls partly inclosing said springs, said walls forming stops for limiting the compression of the springs both in front and in rear of the casing.

2. In a buffing mechanism, the combination with the buffer, center stem coöperating with said buffer to hold the same projected and center stem follower with which the rear end of the stem coöperates, of a spring for advancing said follower and center stem, a casing in which said spring is inclosed at its rear end and having two spring seats on its rear face, relatively heavy springs engaging said seats for holding said casing advanced with a yielding pressure, and a fixed support for the rear end of said last mentioned springs, the said follower, casing and fixed support having coöperating faces constituting stops for limiting the inward movement of the center stem.

3. In a buffing mechanism, the combination with the buffer, the center stem cooperating therewith to hold the same projected and springs of different strength arranged in tandem for advancing said center stem, of a center stem follower, a fixed support and a floating spring casing interposed between said springs, said spring casing being of such length as to coöperate with the

follower and support to limit the compression of both the preliminary and main springs.

4. In a buffing mechanism, the combination with the buffer, center stem, and buffer beam in which said center stem is mounted to move longitudinally, of a center stem follower with which the rear end of the center stem coöperates, adapted to seat against the inner side of the buffer beam, whereby its outward movement is limited, a spring for advancing said follower, a movable casing in which the rear end of the spring is housed, a fixed support having forwardly extending spring chambers, and springs mounted in and projecting from the chambers in said fixed support, the arrangement being such that the preliminary inward movement of the buffer compresses the forward spring, the final inward movement of the buffer compresses the springs interposed between the casing and support and the follower, casing and walls of the chambers abut to form the final stop for limiting the compression of the springs.

5. In a buffing mechanism for the purpose described, the combination with the buffer beam, beams forming platform timbers supporting said buffer beam, and fixed support secured between the proximate faces of said timbers and having parallel spring chambers in its forward side, of springs mounted in said chambers and projecting forwardly, a movable spring casing held advanced by said springs and having a central forwardly projecting spring chamber in its forward side, a spring mounted in said last mentioned chamber and projecting forwardly, a center stem follower with which the said last mentioned spring coöperates, a center stem mounted to move longitudinally in the buffer beam, and a buffer with which the forward end of said center stem coöperates.

6. In a buffing mechanism, the combination with the parallel beams forming the platform timbers, buffer and yieldingly supported center stem, of the side stems, springs mounted on the inner ends of said side stems, side stem brackets rigidly mounted in the outer faces of said timbers, said brackets embodying internal chambers having transverse openings therein for the reception of side stem followers and side stem followers movably mounted in said chambers and removable through said transverse openings.

7. In a buffing mechanism, the combination with the buffer beam, the buffer, the threshold plate secured to and forming the top of the buffer and the name plate supported by the buffer beam and resting at its outer edge on the threshold plate, of bolts for holding the name plate down and springs coöperating with said bolts, whereby the name-plate is held against the buffer beam threshold plate with a yielding pressure.

8. In a buffing mechanism, the combination with the buffer beam, the buffer, the threshold plate secured to and forming the top of the buffer and the name plate supported at its inner edge by the buffer beam and resting at its outer edge on the threshold plate, of bolts passing through the name plate and flat springs coöperating with the lower ends of the bolts and bearing against the buffer beam for holding the name plate down with a yielding pressure.

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