J. M. WAUGH.

PLATFORM BUFFER.

APPLICATION FILED SEPT. 28, 1908.

**1,011,296.**

Patented Dec. 12, 1911.

3 SHEETS—SHEET 1.

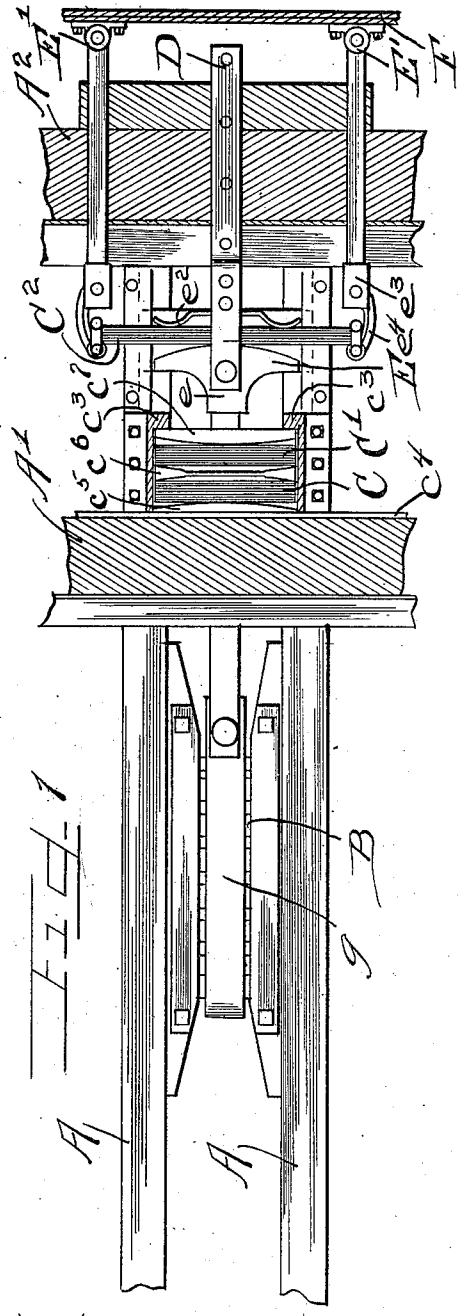

Fig. 1.

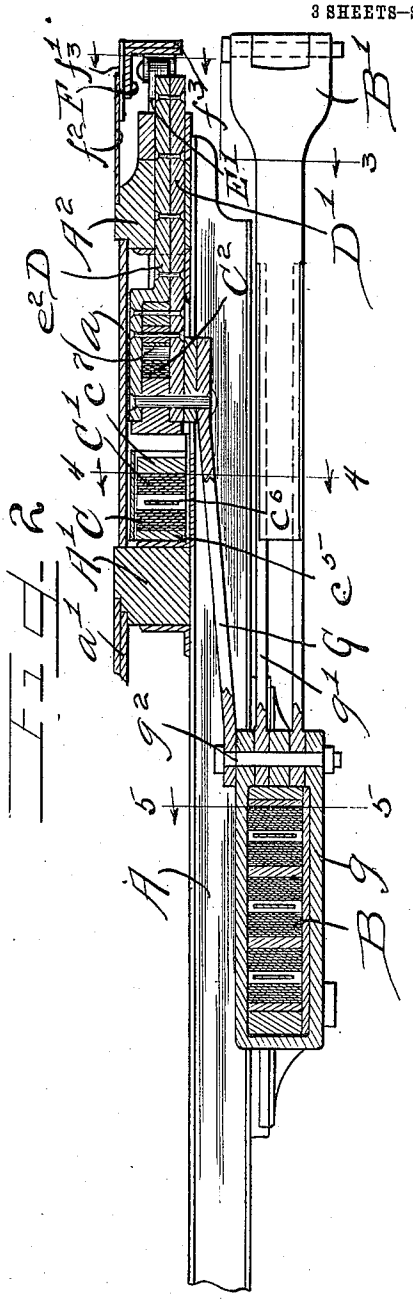

Fig. 2.

Witnesses

J. H. Angell.

E. E. Hannah

Inventor

James Milton Waugh.

by Charles A. Hill Atty

J. M. WAUGH.

PLATFORM BUFFER.

APPLICATION FILED SEPT. 28, 1908.

1,011,296. Patented Dec. 12, 1911.

3 SHEETS—SHEET 2.

Fig. 3

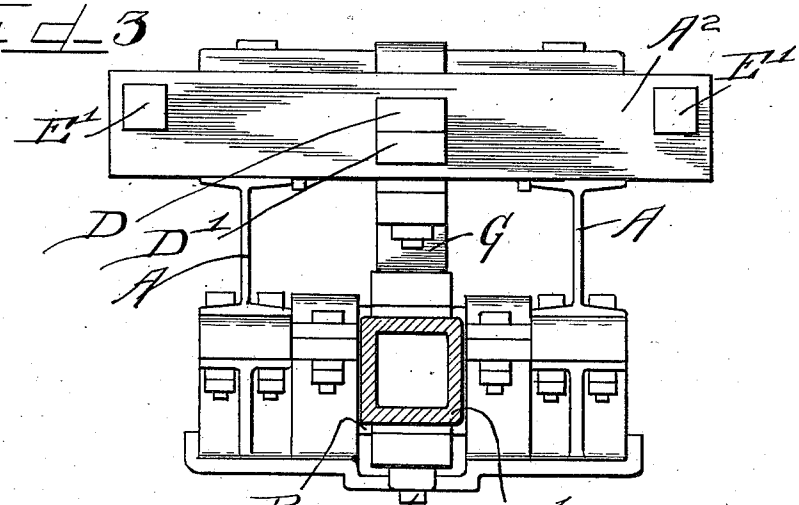


Fig. 4

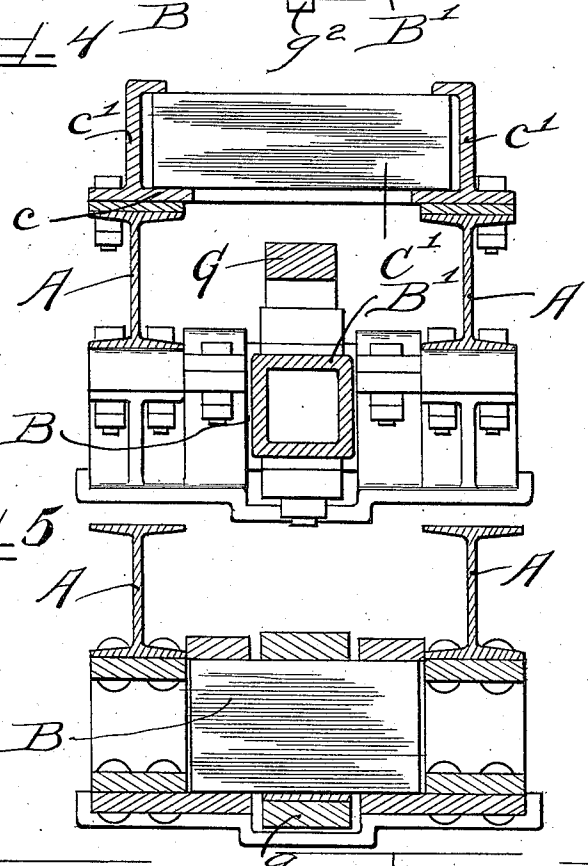


Fig. 5




Witnesses

J. V. Angell

O. E. Hamush

Inventor

James Milton Waugh

by Charles W. Tees

Atty

J. M. WAUGH.

PLATFORM BUFFER.

APPLICATION FILED SEPT. 28, 1908.

1,011,296.

Patented Dec. 12, 1911.

3 SHEETS—SHEET 3.

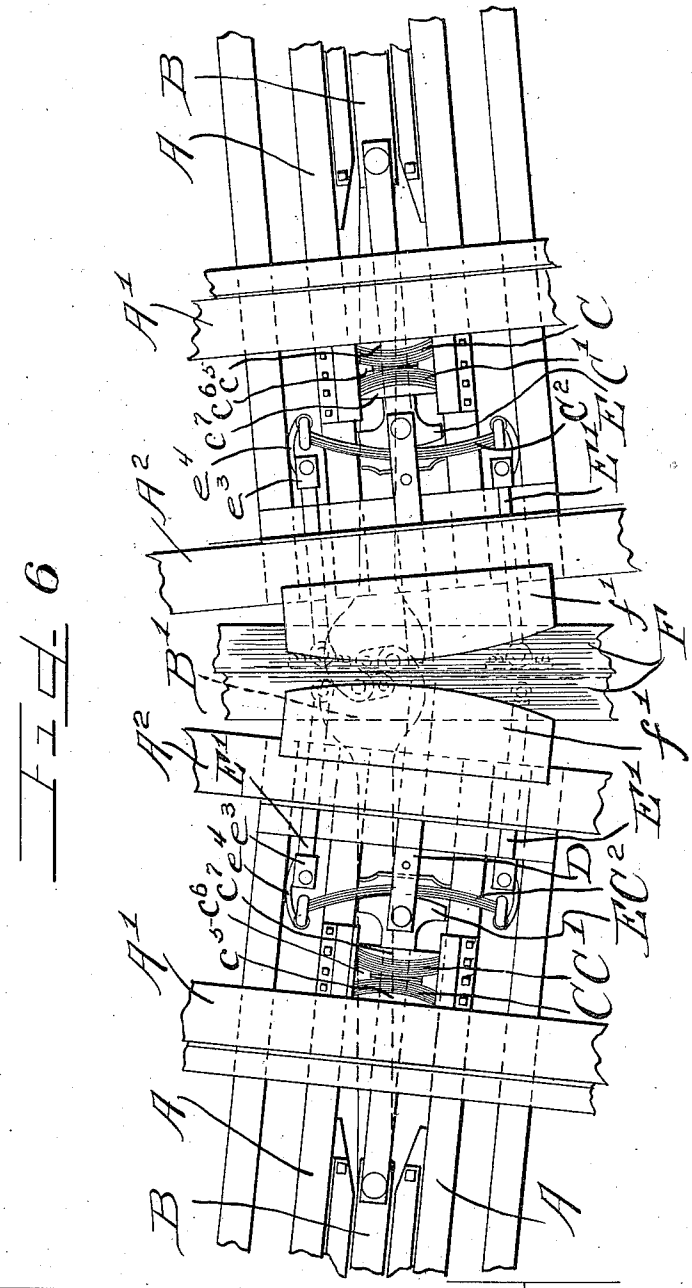

Fig. 6.

Witnesses

J. K. Angell.

K. E. Hannah

Inventor

James Milton Waugh.

by Charles Orlies, Atty

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

# UNITED STATES PATENT OFFICE.

JAMES MILTON WAUGH, OF CHICAGO, ILLINOIS.

## PLATFORM-BUFFER.

1,011,296. Specification of Letters Patent. Patented Dec. 12, 1911.

Application filed September 28, 1908. Serial No. 455,106.

*To all whom it may concern:*

Be it known that I, JAMES MILTON WAUGH, a citizen of the United States, and a resident of the city of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Platform-Buffers; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

In vestibule railway trains the end platforms of the cars are desirably brought in such close relation with each other as to afford as nearly as possible a continuous floor or deck for the purpose of preventing accidental injury to passengers when passing from one car to another and also to exclude the upward and inward drafts of air between the platforms that would otherwise be occasioned by the movements of the train. Of course, the rigid floor frame of the cars can never be brought into such close relation as to well answer this purpose owing to the necessity for a resilient connection between the cars afforded by the draft gear and permitting relative movement of adjacent cars with reference to each other. For this reason platform buffers have come into general use, the object being to afford a resilient extension beyond the ends of the car platforms and held outwardly by means of suitable spring gear, which normally holds the buffer platform outwardly to a sufficient extent to insure a close engagement between the buffer platforms when the cars are coupled.

It is an object of the invention to afford a platform buffer of the class described having under compression a limited rearward travel with relatively slight resistance after which greater stresses are absorbed by the draft gear.

It is a further object of the invention to afford in a device of the class described relatively flat, straight leaf springs in frictional bearing face to face throughout their entire extent and normally acting to hold the platform buffer extended but acting under compression to rapidly decrease the distance between bearing contacts of the spring, thus rapidly increasing the resistance to inward movement of the platform buffer.

It is a further object of the invention to afford in connection with the buffer springs which normally act to hold the buffer extended, and the draft gear, a secondary spring or gear to assist in absorbing excessive stresses, so positioned as to be normally out of action and capable of being brought into action only when the draft gear has acted to approximately half its maximum travel and by the use of which any desired capacity of absorption of buffing stress is attainable without the necessity of sustaining these extreme stresses on the draft gear.

It is a further object of the invention to afford in a device of the class described a positive connection between the gear for the platform buffer and the draft gear of the car whereby the more severe stresses in coupling or otherwise are transmitted directly to the draft gear and whereby in coupling the impact on the drawheads assists in retracting the platform buffer to minimize to a degree the buffing shock thereon and deliver a part of the stress to a secondary buffing spring.

It is also important to afford a construction which affords great flexibility on curves without affecting the operation of the buffer platforms.

The invention embraces many novel features and consists in the matters hereinafter described and more fully pointed out and defined in the appended claims.

In the drawings: Figure 1 is a fragmentary, horizontal section of a car platform provided with a device embodying my invention. Fig. 2 is a central longitudinal section thereof. Fig. 3 is a section taken on line 3—3 of Fig. 2. Fig. 4 is a section taken on line 4—4 of Fig. 2. Fig. 5 is a section taken on line 5—5 of Fig. 2. Fig. 6 is a fragmentary detail plan view showing two cars coupled on curves.

As shown in the drawings: A, indicates the center sills of a car platform provided with devices embodying my invention.

A′—A², indicate transverse sills or blocks rigidly secured on the center sills at and near the end of the car platform, and which, as shown, afford abutments for the buffer embodying this invention, and on which, as shown, rests the floor *a*—*a*′, of the car.

Supported between the center sills A, in any suitable manner is a draft gear B, which, including the drawhead B′, and its connections, may be of any standard type, but, as shown, is of the class set forth in my patents for "draft rigging for railway cars,"

issued July 22, 1902, No. 705,172; "draft rigging for railway cars," issued June 23, 1903, No. 731,725; "draft rigging for railway cars," issued Jan. 7, 1902, No. 690,684; "drawbar draft rigging for car couplers," issued Jan. 7, 1902, No. 690,683; "draft rigging for railway cars," issued April 17, 1906, No. 818,066; though, of course, draft gear of other types or kinds may be used, if preferred.

Rigidly bolted to the sills is a transverse casing comprising a bottom wall or floor $c$, and side walls $c'$, of equal height and which extend nearly to the floor $a$, and are flanged inwardly, as shown in Fig. 4, thus affording a casing open only at the top, the bottom, and the front end, and as shown, inwardly directed abutments or shoulders $c^3$, are provided at the forward end of each of the side walls $c'$. Within the casing thus formed and bearing against a plate $c^4$, secured to the rear abutment or cross sill A', is an abutment member $c^5$, having a flat, rear face to bear against said plate and a convex face extending transversely the car. Bearing against the same at the middle and fitting in said casing flat against each other is a group of spring plates indicated as a whole by C. Spaced therefrom by means of connected, inwardly tapering spacing blocks $c^6$, is a second group of spring plates C', each bearing flat against the others. Bearing centrally against said second or outer group C', of spring plates is an inwardly facing, convex block $c^7$, as shown in Fig. 1, the ends of which are engaged in the casing and behind the abutments $c^3$. The length of said casing is such that the springs at all times exert more or less pressure against the outer convex bearing blocks.

Said buffer block $A^2$, is provided with apertures therethrough near each end and at the middle. Through the middle aperture extends the middle buffer stem, constructed, as shown, of two bars D—D', riveted together and the inner ends of which diverge as shown in Fig. 2, to engage between the same a transversely extended spring $e^2$, and also the abutment head E. The latter, as shown, is approximately equal in length to the distance between the center sills and the outer side thereof is convex and, as compared with the spacing blocks $c^5$—$c^7$, with a comparatively short radius. The rear side of said abutment head is cut away at each end to permit the desired travel thereof and the central portion $e$, thereof is thus extended rearwardly and affords a flat face adapted to bear against the outer bearing block $c^7$. Inserted through the yoke of said center stem in advance of, and bearing against the convex face of the abutment head E, and pressed thereon by the laterally and rearwardly directed ends of a spring $e^2$, is a group $C^2$, of relatively long, flat leaf spring plates. Slidable in the apertures in the ends of the buffer blocks $A^2$, are lateral buffer stems E', the inner ends of which are each provided with a head $e^3$, carrying a stirrup or link $e^4$, pivotally engaging the outer ends respectively of the primary spring group $C^2$, as shown in Fig. 1. Said buffer stems E', extend beyond the outer end of the central buffer stem and at their extremities are coupled to, and support the buffer plate F, as shown in Figs. 1 and 2. Said buffer plate comprises an angle bar of suitable width of flange and web, which extends inwardly and is attached to the sliding floor section $f'$, which slides beneath the cover plate $f^2$, as shown in Fig. 2, and as shown, on the outer side of said angle bar is a plate $f^3$, which reinforces the same, all details of construction for buffer plates may, however, be as is usual with standard steel platforms for such cars.

Rigidly secured on the under side and inner end of the center buffer stem, and as shown, riveted through the abutment head E, is a buffing bar G, the rear or inner end of which extends downwardly and rearwardly and is engaged on the draft yoke $g$, and tail straps $g'$, of the main draft gear by means of a bolt $g^2$.

The operation is as follows: Inasmuch as the center buffer stem is rigidly attached by means of the buffing bar G, to the main draft gear, the first stress in coupling is first applied on the main draft gear springs by engagement of the drawheads and acting to drive the drawheads inwardly to a greater or less extent, the abutment head E, and yoke D, of course, moving inwardly under the stress, thus relieving the platform buffer of most of the stress of the blow it would otherwise receive. The buffer platforms coming together however, the buffer stems E', are first pressed inwardly by the buffing plates, thus flexing the spring group $C^2$, around the abutment head E, and owing to the friction due to the surface resistance of the plates in mutual engagement, absorbing a very large portion of any shock or impact thereon. If the inward stress be insufficient to force the buffer stems E', inwardly to permit the buffer plate to engage the central buffer stem, of course, also of necessity forcing the draft head inwardly the stress for the first half of the inward travel of the drawhead is absorbed by the main draft gear springs. If the resistance in the main draft gear be not sufficient to absorb the stress, the abutment block then engages the spacing plate or block $c^7$, thus communicating the stress of the impact not only to the main draft gear but as well to the secondary group or groups of springs C—C', which thus, for the remainder of the inward travel under buffing serve a very important purpose as auxiliary buffing springs to absorb excessive shock in buffing. Any desired ca-

pacity for absorbing the shocks may be secured to the construction, for it is only necessary to increase the number of plates in one or both groups or increase the number of groups in the secondary or reserve casing, leaving the number of plates in each group the same, in either of which events the large frictional surface afforded by increasing the number of plates insures a greater resistance because of such friction. The thickness of said plates in said groups, is far less important than the number of plates inasmuch as the absorption of stress either upon the main draft gear, the auxiliary gear, or the platform buffer is due mainly to the frictional effect resulting from the large surfaces of said spring plates each in positive engagement with the corresponding surfaces of equal area of the adjacent plates, thus the surface friction not only enormously augments the resistance of the springs to flexing under impact, but what is equally, if not more important, such friction actually absorbs the stress however applied and permits the platform to return gently to normal whether the inward pressure, however excessive, be removed instantaneously or gradually. Nevertheless practically any stress in buffing may be absorbed first by the draft gear during the first half of its travel and thence any desired additional resistance or absorbing power by varying the thickness and number of the reserve plates in the auxiliary set or sets. This auxiliary gear works only under excessive buffing stress and under all other conditions is neutral and wholly out of action as is also the buffer platform spring group $C^2$, which is practically intended to maintain a light outward pressure sufficient to hold the platforms in contact.

Of course, I am well aware that although I have shown my invention as embodied in connection with my own draft gear before mentioned, the construction may be employed with other draft gears, should it be desired, and furthermore, other details of the construction may be varied. I therefore do not purpose limiting this application for patent otherwise than necessitated by the prior art.

I claim as my invention:

1. In a platform buffer, a center buffer stem, a rounded abutment block secured at the inner end thereof, a transversely extending group of flat leaf springs bearing rearwardly on said abutment block, lateral buffer stems to the inner ends of which the group of springs are attached, and a spring at the rear of and adapted to be engaged by said abutment block near maximum compressive stress.

2. A draft gear, a platform buffer operatively connected thereto and embracing a center buffer stem, a rounded abutment block secured at the inner end thereof, a transversely extending group of flat leaf springs adapted to bear rearwardly upon the rounded face of said abutment block, lateral buffer stems to the inner ends of which the group of springs is yieldingly attached at its ends, a buffer plate secured on the ends of the lateral buffer stems and auxiliary buffer springs positioned to be engaged by said abutment head at about half the inward travel of the draft gear under abnormal stress.

3. In a platform buffer the combination with the buffer plate, of lateral buffer stems on which the buffer plate is secured, a central buffer stem unconnected with the buffer plate, and slotted at its inner end horizontally, a group of straight, flat, leaf springs extending through the slot in said buffer stem and connected with the inner ends of the lateral buffer stems, and bearing rearwardly at its middle on the center buffer stem, a draft gear, a rigid connection between the draft gear and the central buffer stem and auxiliary springs positioned behind said buffer stem and adapted to be engaged thereby when the draft gear and buffer platform have been forced inwardly about half their limit of travel in buffing.

4. In a platform buffer the combination with the draft gear and the buffer plates of a central and lateral buffer stems, the latter connected at their outer ends with the buffer plate, a rounded abutment block secured at the inner end of said central buffer stem, a group of duplicate straight, flat spring plates bearing at their center rearwardly on the abutment block, means connecting the ends thereof swingingly with the lateral buffer stems, a rigid connection between the draft gear and said abutment block, and a reserve shock absorbing device embracing groups of flat spring plates in frictional engagement throughout their entire face area, said groups so positioned as to be engaged and compressed by the abutment block when the draft gear and platform buffer have completed a part of their inward travel under compression.

5. In a device of the class described the combination with a draft gear and a platform buffer of a rigid connection between said draft gear and one of the buffer stems, a buffer spring acting to bear said buffer stem rearwardly under compression and an auxiliary shock absorbing device comprising a casing and a plurality of groups of spring plates supported therein with the plates thereof in frictional engagement and positioned to be brought under compression when the draft gear has approximately reached half its inward travel in buffing.

6. The combination with a draft gear and a buffer platform of a center buffer stem adapted to be forced inwardly under buffing stress, a group of transversely arranged leaf

springs in frictional bearing face to face and positively engaged at their ends with the buffer platform and at their middle engaging the central buffer stem, a casing at the rear of said central buffer stem and groups of flat spring plates in frictional engagement in said casing and adapted to be engaged and compressed only as the draft gear and platform buffer approach the limit of travel under compression, said plates acting frictionally to absorb both the impact and initial recoil.

7. In a device of the class described a platform buffer, a draft gear positioned below the same and rigidly secured thereto, groups of spring plates arranged transversely at the rear of the platform buffer and adapted to be engaged and compressed by a part thereon only when the buffing stress is approaching the maximum absorbing power of the draft gear.

8. In a device of the class described a casing, groups of leaf springs each comprising a plurality of flat, frictional engaging plates of approximately equal length, and slidable in the casing, convex bearing blocks facing inwardly and centrally on the groups of springs in the casing, spacing blocks engaged betwen the ends of each group, said casing and springs being disposed in alinement with, and at the rear of the central buffer stem and wholly disconnected from both the draft gear and platform buffer and adapted to come into action only to assist in absorbing excessive stress in buffing.

9. A platform buffer in combination with the buffer stem, a transverse abutment head secured on the inner end thereof, leaf springs bearing rearwardly on the abutment head, a spring acting to force the leaf springs at all times against the abutment block, lateral buffer stems extending beyond the central buffer stem and shackled to the ends of said group of springs, and a buffer platform supported on the lateral buffer stems to flex the group of springs to carry the structure inwardly as a whole and a resilient stop for the abutment head.

10. A platform buffer embracing in connection with a center buffer stem yoked at its inner end, a transverse abutment head secured in said yoke at the inner end, transverse leaf springs extending through the yoke and in flat frictional bearing face to face, a spring acting to force the same at all times against the abutment block, lateral buffer stems extending beyond the yoke and shackled to the ends of said groups of springs and a buffer plate attached to, and adapted first to engage the lateral buffer stems to flex the primary group of springs and next to impel the yoke and to carry the structure inwardly as a whole.

11. In a device of the class described a buffer platform, a buffer spring consisting of a group of friction spring plates, a bearing block having a curved face against which the spring bears, means pivotally connecting the ends of the spring and the buffer platform together, and means for yieldingly holding the buffer spring against the rounded face of the bearing block.

12. In a device of the class described a buffer platform, a spring consisting of friction spring plates, buffer stems pivotally connected to both the platform and spring, a central buffing stem non-connected to the buffer platform and connected with said spring and adapted to be engaged by the buffer platform in buffing, a bearing block pivoted to the central buffing stem having a curved face against which the spring bears and an auxiliary buffing spring adapted to be actuated by engagement of the bearing block thereagainst.

13. In a device of the class described an initial buffing spring, a draft gear connected therewith and adapted to coact therewith in absorbing buffing stress, and an auxiliary buffing mechanism non-connected with either the aforesaid buffing spring or the draft gear and adapted to absorb buffing stress only after the draft gear has been utilized to absorb part of the buffing stress.

14. In a device of the class described a buffer platform, a plurality of buffing mechanisms, means connecting one of the buffing mechanisms with the buffer platform, a draft gear and means connecting one of said buffing mechanisms with the draft gear necessitating the draft gear absorbing part of the buffing stress before one of the buffing mechanisms is brought into operation.

15. In a device of the class described a buffer platform, a buffer spring, buffer stems pivotally connected to the platform and spring, a member rounded adjacent the spring and an auxiliary buffing mechanism at the rear of said member adapted to be engaged by inward movement of said member.

16. In a device of the class a buffer platform, a buffer spring comprising spring plates in frictional engagement, means pivotally connecting the platform and ends of the buffer spring, a bearing member, a spring for holding the buffer spring in engagement with the bearing member and an auxiliary buffing mechanism entirely unconnected with any part of the buffer platform and parts.

17. In a device of the class described a buffer platform, a spring comprising friction plates, a bearing member, buffer stems pivotally connected with the platform and the spring, a buffer stem pivotally connected with the bearing member and an auxiliary buffing mechanism in alinement with the bearing member and adapted to be engaged thereby.

18. In a device of the class described a

buffer platform, a central buffer stem non-connected therewith, a bearing member secured thereto, a buffing mechanism adapted to be engaged by the bearing member, a draft gear and an initial buffing mechanism connected therewith and pivotally connected with the buffer platform.

19. In a device of the class described an initial buffing mechanism, a draft gear connected therewith and a secondary buffing mechanism positioned to be brought into operation by the aforesaid buffing mechanism when the buffing stress exceeds part of the capacity of the initial buffing mechanism and draft gear.

20. In a device of the class described a platform buffer, a spring pivotally connected therewith adapted to absorb initial buffing stress and then move inwardly without being further compressed, and a draft gear adapted to absorb buffing stress when the spring moves inwardly.

21. In a device of the class described, a buffer platform, an initial buffing spring comprising friction plates supported for either end to move relatively of the other in absorbing buffing stress, a link connected with the draft gear and adapted to be moved by the initial buffing spring after a predetermined buffing pressure has been exerted thereon, a draft gear and a secondary buffing mechanism positioned to coact with the main draft gear to absorb excessive buffing stresses.

22. In a device of the class described a buffer platform, a buffing spring comprising spring friction plates, means connecting the platform and buffing spring adapting either end of the buffing spring to yield relatively of the opposite end in buffing, means for preventing further absorption of stress by the buffing spring after a predetermined limit, and non-connected mechanisms adapted to conjointly absorb all buffing stress after the buffing limit of the buffing spring is reached.

23. In a device of the class described a buffer platform, a movable pivot member, a spring comprising flat plates bearing at their middle on the pivot, connections between the buffer platform and ends of the spring for oscillating the spring on the pivot member, and a buffing mechanism adapted to be engaged by the movable pivot member and to coact with the spring in absorbing buffing stress.

24. In a device of the class described a buffer platform, a transversely extending buffing spring, a longitudinally movable bearing block acting as a pivot for the buffing spring to turn on, buffing stems connecting the ends of the buffing spring with the platform buffer and a link connected with the bearing block to be moved longitudinally by the buffing spring when the buffing stress exceeds its capacity.

25. In a device of the class described a buffer platform, a transversely extending buffing spring, a longitudinally movable bearing block acting as a pivot for the buffing spring to turn on, buffing stems connecting the ends of the buffing spring with the platform buffer, a longitudinally movable link connected with the bearing block to permit the buffing spring to move the same longitudinally when the buffing stress exceeds its capacity, and an auxiliary buffing mechanism engaged by the longitudinally moving bearing block to absorb buffing stress.

In testimony whereof I have hereunto subscribed my name in the presence of two subscribing witnesses.

JAMES MILTON WAUGH.

Witnesses:

K. E. HANNAH,

LAWRENCE REIBSTEIN.