Dec. 5, 1961 J. G. CANNON ET AL 3,011,654

DRAFT APPARATUS WITH NON-BREAKABLE EMERGENCY RELEASE MEANS

Filed Feb. 18, 1960 2 Sheets-Sheet 1

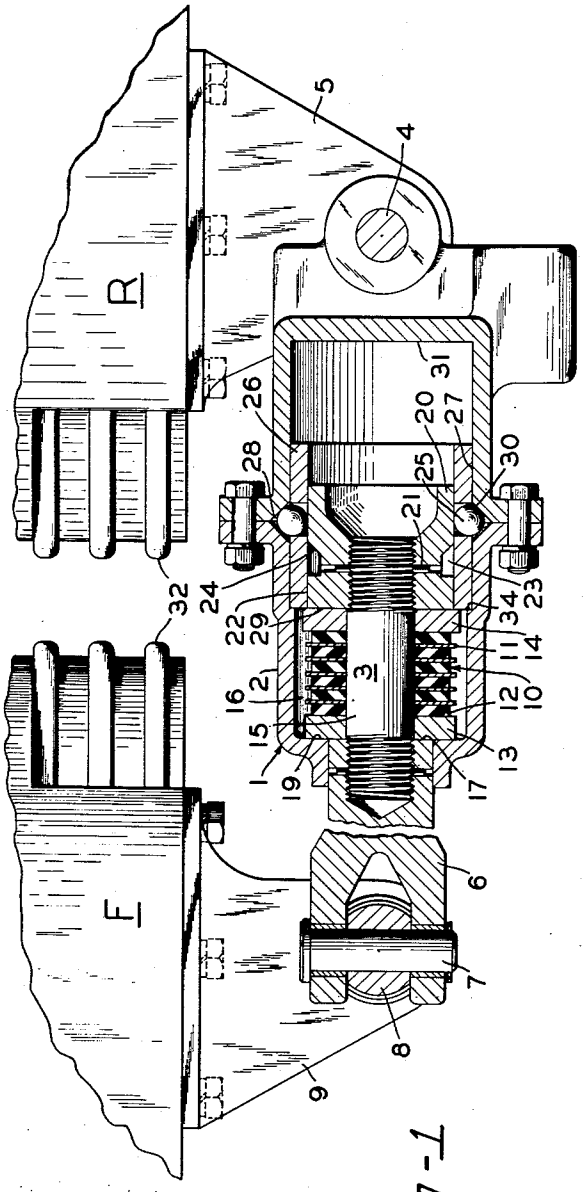


Fig - 1

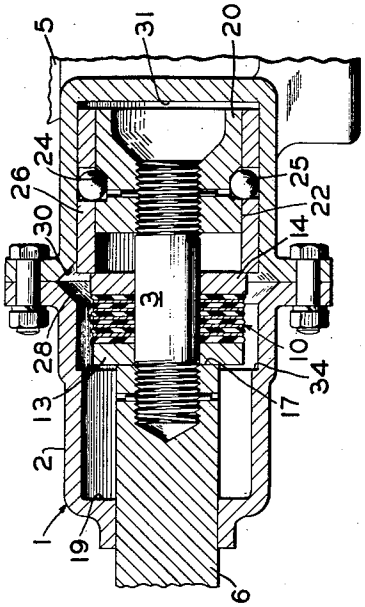


Fig - 2

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Filed Feb. 18, 1960 2 Sheets-Sheet 2

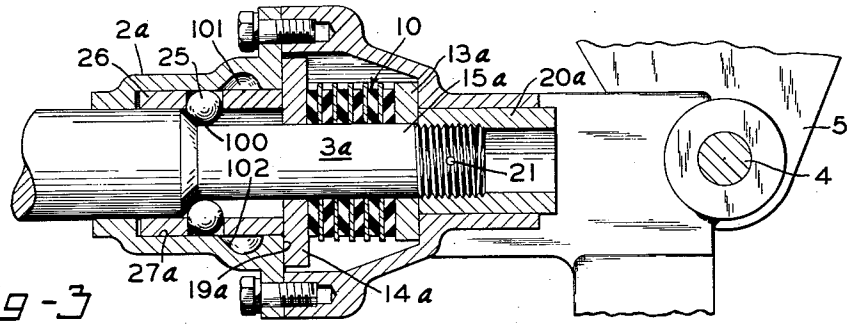


Fig-3

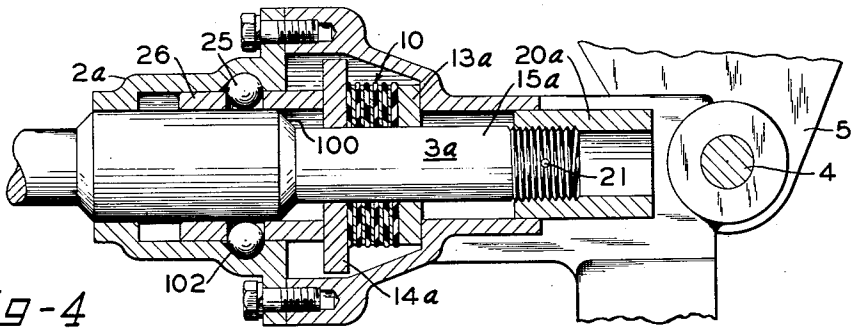


Fig-4

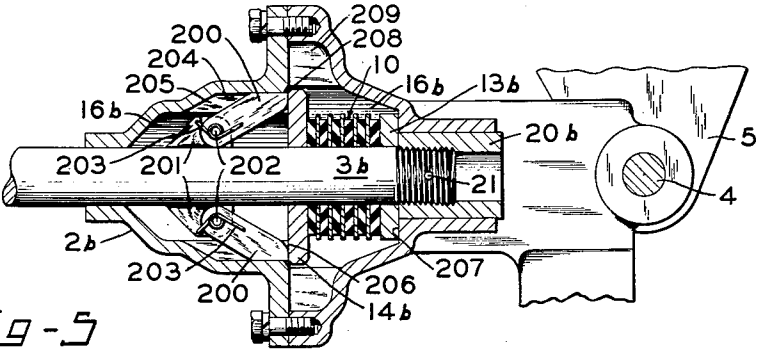


Fig-5

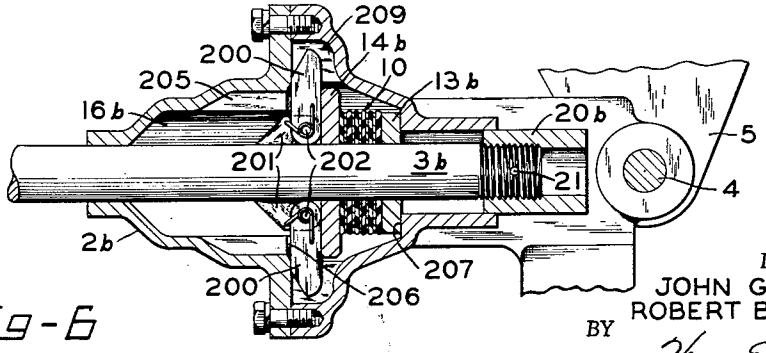


Fig-6

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DRAFT APPARATUS WITH NON-BREAKABLE EMERGENCY RELEASE MEANS

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12 Claims. (Cl. 213—1)

This invention relates to draft apparatus for interconnecting two vehicles, such as railway cars, and more particularly relates to draft apparatus embodying non-breakable emergency release means which permits substantial shortening of the draft apparatus in response to an excessive buff force.

It has heretofore been proposed to connect two railway cars via a draft apparatus or "draft gear" embodying a breakable emergency release means such as a shear pin or bolt designed to shear when buff force exceeds a predetermined value. This, in turn, permits a telescopic contraction and shortening of the overall length of the draft apparatus so that the anti-climber plates on the aligned bumpers at adjacent ends of the cars can engage and take the thrust and thus prevent or at least inhibit telescoping of the cars. With such an arrangement, it is apparent that each time the shear bolt or other breakable emergency release element is broken in response to an excessive buff force, the broken release element must be removed and replaced in order to restore the draft apparatus to effective operating condition.

The principal object of this invention is therefore to provide an improved draft apparatus embodying non-breakable emergency release means which obviates the necessity of repairing the draft apparatus after each operation of the release means.

According to this object, the improved draft apparatus comprises two members each longitudinally movable relative to the other and each connected to a respective vehicle, and a non-breakable emergency release means in the form of a latch means which during buffing forces of less than a predetermined value provides a substantially rigid thrust connection between one of said members and one end of a resilient means, the opposite end of which always operatively engages the other of said members during buffing forces. If, however, buffing force exceeds said value, the members will be moved thereby relatively toward each other far enough to cause the latch means to be cammed into a recess provided in said other member and thus disestablish said thrust connection and nullify the action of or "cage" the resilient means because both of its ends will now operatively engage spaced parts of said other member; and this will permit the buffing force to move the members relatively toward each other a greater degree, without resistance from the now caged resilient means, to permit the anti-climber plates to engage and transmit the buffing force directly between the vehicles in bypass of the now collapsed or shortened draft apparatus. When the members are subsequently moved relatively apart under a draft force, said latch means will be restored automatically to its original condition and reestablish said thrust connection without requiring removal, repair or replacement of any part of the draft apparatus.

According to different embodiments of the invention, the latch means may comprise latching balls normally stationarily disposed in a notch in a body member and carried in a tubular cage and cammed by the beveled side of said notch into a recess forming part of a rod member during buffing forces exceeding said predetermined value. Or the latch means may comprise latching balls carried by a tubular cage and normally moved by a rod member during buffing forces and cammed into a recess provided in a body member when buffing forces exceed said predetermined value. The latch means may, if preferred, be of the toggle type collapsibly secured to a rod member and normally held rocked inward toward the axis of said rod member and into inflexible thrust-transmitting longitudinal contact with the resilient means by a body member, said latch means being cammed into a recess in the body member under a buffing force exceeding said predetermined value.

Other objects and advantages will become apparent from the following more detailed description of the invention and from the accompanying drawings wherein:

FIG. 1 is an elevation view, partly in section and partly in outline, showing portions of two railway cars connected by a draft apparatus embodying a preferred form of non-breakable release means shown in a normal position;

FIG. 2 is a partial section view of the draft apparatus of FIG. 1 with the release means shown in a released position assumed when buff force exceeds a predetermined value;

FIGS. 3 and 4 are partial section views of a draft apparatus embodying another form of emergency release means shown in normal position and released position, respectively; and

FIGS. 5 and 6 are partial section views of a draft apparatus embodying still another form of emergency release means shown in normal position and released position, respectively.

Description—FIGS. 1, 2

As shown in these figures, a draft apparatus 1 comprises two members 2, 3 movable longitudinally relative to each other and each connected at their remote ends in any conventional manner to adjacent railway cars F and R. For example, member 2, which is in the form of a hollow sectionalized body, may be pivotally connected by a horizontal pin 4 to an anchor 5 dependingly secured to the car body of car R; and member 3, which is in the form of a draw bar or rod projecting telescopingly into the body 2, may be coaxially connected at its remote end to a clevis 6 that to all intents and purposes constitutes part of rod 3 and is staked by a pin 7 to a shaft 8 which is rotatably disposed in an anchor 9 dependingly secured to the car body of car F.

Draft and buff forces are transmitted between the cars F and R by structure forming part of the draft apparatus and including a resilient means 10 preferably in the form of a sandwich comprising alternately arranged metal washers, like 11, and axially compressible rubber washers, like 12, or, if preferred, in the form of an axially compressible helical spring (not shown). In any event, this means 10 and also two thrust washers 13, 14 at opposite ends thereof encircle a portion 15 of rod 3 that projects into a chamber 16 within the body 2. The inner end 17 of the clevis 6 constitutes in effect a radial shoulder joining a reduced diameter rod portion 15 to a larger diameter rod portion (the clevis), which clevis has slidably guided contact within an aligned bore through an end wall 19 of said chamber.

Positively secured to rod 3 is a latch release element 20, preferably in the form of a nut screw-threaded onto the inner end of rod 3 and staked in a desired axial position on said rod by a transverse pin 21. Formed in the cylindrical outer surface 22 of element 20 is an annular groove or recess 23 which has a beveled end surface 24 constituting a cam. Recess 23 is adapted to receive a plurality of balls 25 constituting part of a latch means. These balls 25 are partially disposed in and project exteriorly of respective holes arranged in a ring and cut through the tubular wall of a tubular guide or cage

element 26 that surrounds the element 20 and has slidably guided contact with the wall of a bore 27 in body 2. As shown in FIG. 1, the balls 25 normally contact the outer cylindrical surface 22 of element 20 rightward of recess 23, and project into an annular V-shaped notch 28 either cut into the wall of bore 27 or preferably (as shown) defined by beveled ends of two abutting sections of the hollow sectionalized body 2, each of which sections provides a portion of bore 27.

Operation—FIGS. 1 and 2

Assume initially that the various components of the draft apparatus are in the relative positions in which they are shown in FIG. 1. Under this condition, the balls 25 will engage surface 22 of release element 20 and protrude into notch 28, for latching the cage element 26 to the body 2 and thus defining a normal position of a "latch type release means" including 25, 26, 20.

Draft forces will cause front car F to move in a direction away from rear car R and thus move rod 3 outwardly of body 2. Thus draft forces will be transmitted from rod 3 to body 2 via end 29 of element 20, washer 14, resilient means 10, washer 13 and end wall 19. Thus during draft operation, no thrust will be exerted on the balls 25 because washer 14 will not effectively contact cage element 26; and said balls may roll freely on surface 22 as element 20 is moved axially by rod 3; and the "release means" 25, 26, 20 will remain in normal position.

When, however, cars F and R move relatively toward each other in response to a buff force, rod 3 will be moved inwardly of body 2. Buff forces will be transmitted from rod 3 to body 2 via shoulder 17, washer 13, resilient means 10, washer 14, cage element 26, balls 25 and the beveled, cam-constituting side wall 30 of notch 28 and thus cause the body 2 and hence the rear car R to tend to move in the direction of rod 3. If this buff force exceeds a predetermined value, such as say 115,000 pounds, the rod 3 and hence element 20 will move inwardly (rightwardly) far enough against resistance of resilient means 10 to bring the recess 23 into registry with the balls 25. Thereupon, the balls 25 will be forced out of notch 28 and at an angle toward the axis of rod 3 and into the recess 23 by the resultant of the rightwardly acting horizontal force applied to the balls by the cage element 26 and of the generally downward force acting perpendicularly to the cam-constituting side 30 of notch 28. As the balls 25 are thus ejected from notch 28, the cage element 26 will be unlatched from body 2 and latched to rod 3. This will render the resilient means ineffectual because it will now be effectively compressed between different parts (17, 26) now both rigidly constituting part of rod 3 due to the latching of elements 20, 26 via balls 25. Hence, rod 3 and the release element 20 and cage element 26 can and will be moved rightward in unison relative to the body 2 by the buff force and to a position, shown in FIG. 3, defining a released position of the "release means." The distance between the inner end of cage element 26 and end wall 31 of chamber 16 must be sufficient to permit the effective overall length of body 2 and rod 3 and hence of the draft apparatus 1 to be shortened enough to so reduce the distance between the cars F and R that aligned anti-climber plates 32 (FIG. 1) at the adjacent ends of the cars may interlockingly engage and prevent telescoping of these cars.

After the buff force is dissipated, the "release means" 25, 26, 20 will remain in released position until rod 3 is pulled outwardly (leftward) relative to body 2 by a draft force. Thereupon rod 3, release element 20, balls 25, cage element 26 and resilient means 10 will initially move leftward in unison relative to the body 2 without compressing means 10 because said means will then be effectively caged due to contact of washer 13 with rod shoulder 17 and contact of washer 14 with said rod via element 26, balls 25 and element 20. When, however, the rod 3 has moved far enough leftward to carry balls 25 into registry with notch 28, the cage element 26 will strike a shoulder 34 and be stopped; whereupon, as rod 3 continues leftward, the beveled cam-constituting surface 24 of element 20 will cam the balls outward into the notch. This will unlatch the elements 26, 20 so that element 20 and the rod 3 may thus now move further leftward relative to the cage element 26 and carry end 29 of element 20 into contact with washer 14.

It is to be noted that shoulder 34, or some other form of stop for cage element 26, is necessary to assure that all of the balls 25 (especially the uppermost ones which will tend to remain in recess 23 due to gravity) will be concurrently ejected from notch 28. Also when the balls 25 are in normal position, their centers should be in an imaginary circle of a diameter which is less than (as shown in FIG. 1) or equal to the diameter of bore 27; and when the balls are in released position, their centers should lie in an imaginary circle having a diameter greater than (as shown in FIG. 2) or equal to the outer diameter of element 20. This is necessary to assure that the balls 25 can be cammed into recess 23 and notch 28.

Description and operation—FIGS. 3, 4 and FIGS. 5, 6

To avoid unnecessary redescription, components of the draft apparatus constructed according to these different embodiments of the invention which are identical with those already described in connection with FIGS. 1 and 2 will be denoted by like reference numerals; and those components which are substantially similar in structure and function will be denoted by the same reference numerals as in FIG. 1 but with a suffix "*a*" (for FIGS. 3, 4) or "*b*" (for FIGS. 5, 6) added.

The apparatus shown in FIGS. 3, 4 differs from that shown in FIGS. 1, 2, primarily in that the balls 25 engage a reduced diameter portion 15*a* of rod 3*a* in the normal position of the release means and an annular beveled cam shoulder 100 is provided on rod 3*a* and effective upon an excessive buff force to cam said balls outward from the rod axis and into an annular recess 101 in the body 2*a* (rather than inward into an element carried by the rod).

More specifically, when buff forces are less than the predetermined value, the rod 3*a* and (through cam shoulder 100) the balls 25 and cage 26 will move rightward in unison for operatively through washer 14*a* compressing resilient means 10 and thereby resiliently transmitting the buff force to the body 2 via washer 13*a*. If buff forces exceed the predetermined value, however, rod 3*a* will move the cage 26 rightward far enough against resistance of resilient means 10 to carry balls 25 into proximity with the left-hand end of recess 101; whereupon during further rightward movement of rod 3*a*, shoulder 100 will cam the balls 25 away from the rod axis and into the recess, and thus latch the cage 26 to the body 2*a* and unlatch the rod 3*a* from said cage. This will free the rod 3*a* and enable the buff force to move said rod rightward far enough to permit engagement of the anti-climber plates 32 (see FIG. 1).

The "emergency release means" 25, 26, 3*a* will now be in the abnormal position in which it is shown in FIG. 4 and will remain in this position until restored to normal position (FIG. 3) by application of a slight draft force to rod 3*a*. During such draft force, rod 3*a* will be pulled leftward without resistance; and as cam shoulder 100 moves leftward past balls 25, the compressed resilient means 10 will be uncaged. The power stored in resilient means 10 will thereupon act through cage 26 to eject balls 25 from recess 101 by camming them along an inclined cam-constituting surface 102 of recess 101 and in toward the rod axis and return the balls into contact with the exterior of reduced diameter portion 15*a*. Thereupon the cage 26 and balls 25 and rod 3*a* will move leftward in unison relative to the body 2*a* until the parts reassume the relative positions in which they are shown in FIG. 3.

It will be understood that draft forces will thereafter be transmitted from car F to car R via rod 3*a*, nut 20*a*, washer 13*a*, resilient means 10, washer 14*a* and shoulder 19*a* of body 20.

It should also be noted that the diameter of reduced diameter portion 15*a* must be great enough to cause the centers of the balls 25 to lie in an imaginary circle of a diameter equal to (as shown in FIG. 3) or greater than bore 27*a* when said balls are in normal position; and the maximum diameter of recess 101 should be limited so that said imaginary circle, when the balls 25 are in released position, will have a diameter equal to (as shown in FIG. 4) or less than the diameter of bore 27*a*. This is necessary to assure that the balls can be cammed into and out of recess 101.

The apparatus shown in FIGS. 5, 6 differs from that shown in FIGS. 1, 2, primarily in that the "non-breakable emergency release means" comprises a spring-biased (rather than ball-type) latch means in the form of a plurality of arms 200, each pivotally connected to respective fins 201 projecting radially from the rod 3*b*, such as by corresponding pins 202 that extend substantially tangentially to the cylindrical surface of said rod. A mouse-trap-like spring 203 preferably hooks into each fin 201 and arm 200 for lightly biasing each arm toward contact with a respective surface 204 constituting the base of a corresponding longitudinally extending arm-receiving slot or recess 205 provided in the body 2*b*. These springs 203 thus maintain the arms 200 at an angle to the rod 3*b* and maintain them within the slots 205 when said rod is pulled leftward by draft forces transmitted to body 2*b* via nut 20*b*, washer 13*b*, resilient means 10, washer 14*b*, and an end surface 206 of the body 2*b*, said end surface being defined by the end of a plurality of spline-like ribs formed integrally with the body and separating the respective slots 205 from each other. Thus during draft forces, springs 203 assure that the uppermost arms 200 cannot drop down into contact with the rod 3*b* and prevent camming of said arms during buff forces in the manner presently to be described. Also, during draft forces no thrust will be imposed on the latch arms 200 and they will move frictionlessly (except for the light bias of spring 203) longitudinally relative to surfaces 204 of the slots 205 which surround a circular chamber 16*b*.

When the rod 3*b* is pushed rightward into the body 2*b* responsively to buff forces, the buff force will be transmitted from the rod to the body via pins 202, arms 200, washer 14*b*, resilient means 10, washer 13*b* and end wall 207 which constitutes a stop. However, if the buff force should exceed the predetermined value, arms 200 will be shifted far enough rightward against resistance of resilient means 10 to permit the arms to pass beyond surface 204 and start to slide radially outward and around beveled cam rim 208; and after a given degree of movement the arms will extend into corresponding circumferentially-spaced arm-receiving slots 209 and swing to a generally radial position. This will cause rod 3*b* to move into body 2*b* sufficiently to permit engagement of the anti-climber plates 32 (FIG. 1); whereupon the "release means" 200, 201 will be in abnormal position as shown in FIG. 6. The "release means" will remain in abnormal position because resilient means 10 will be effectively caged by contact of arms 200 with body surface 206 and with body wall 207 via 14*b*, 10, 13*b* and because no force will act to restore the release means to normal position.

However, as soon as a draft force is applied to rod 3*b*, it will be pulled leftward and cam the arms 200 on body rim 208 until means 10 can apply an effective force via said arms to the rod and help restore the "release means" 200, 201 to the normal position in which it is shown in FIG. 5.

It will be understood that the rods 3*a*, 3*b* and bodies 2*a*, 2*b* may be connected to cars F and R in the same manner as the rod 3 and body 2 shown in FIG. 1.

Summary

It will thus be seen that draft apparatus of the "draft gear" type has been provided embodying a "non-breakable emergency release means" comprising latch means in the form of balls 25 or toggle arms 200. These release means will not be subjected to thrust during transmission of draft forces and will transmit thrust during buff operation provided buff force does not exceed a predetermined value. If buff force does exceed said value, however, then the release means will become unlatched but will not break, and will permit contraction of the draft apparatus so the anti-climber plates may engage. After the buff shock is dissipated, the release means can be readily restored to normal operating condition merely by applying a relative low draft force to the apparatus.

Having now described the invention, what we claim as new and desire to secure by Letters Patent is:

1. A draft apparatus comprising, in combination, two telescopically arranged members attachable respectively to tractor and trailer vehicles, cushioning means interposed between said members to provide a resilient connection therebetween during draft and buffing action of the tractor and trailer vehicles, releasable latch means normally securing said cushioning means against movement relative to one of said members, and means responsive to relative telescoping movement of said two members exceeding a certain amount during buffing action for releasing said latch means to free said cushioning means for movement relative to said one of the members, and being operatively responsive upon draft action after said excessive buffing action is dissipated to again secure said cushioning means against movement relative to said one member.

2. A draft apparatus comprising, in combination, two members each longitudinally movable relative to the other, means for operatively connecting each of said members to a respective vehicle, resilient means interposed between said members, and non-breakable emergency release means including at least one element normally positioned to establish a substantially rigid thrust connection between one of said members and one end of said resilient means during buff forces, one means forming part of the other of said members and providing a surface via which buff forces can be transmitted to the other end of said resilient means for transmission via said thrust connection to said one member, other means longitudinally movable by said other member and providing a recess capable of receiving each such element and normally disposed out of longitudinal registry with each such element, and means carried by at least one of said members and operatively responsive to movement of said members more than a predetermined distance relatively toward each other against resistance of said resilient means due to an abnormally high buff force to urge each element into said recess to disestablish such thrust connection to permit said high buff force to effect a further reduction in the overall length of said members, and being operatively responsive to movement of said members away from each other upon dissipation of said abnormally high buff force to reposition each such element in said normal position to reestablish said substantially rigid thrust connection between said one member and said one end of said resilient means.

3. A draft apparatus comprising, in combination, two members each longitudinally movable relative to the other and each operatively connectable to a respective vehicle, resilient means interposed between said members to transmit draft and buff forces between the respective vehicles, and non-breakable emergency release means comprising latch means movable between a normal position in which it establishes a substantially inflexible thrust connection between one of said members and the resilient means during buff forces and a released position in which it disestablishes said connection and

frees said one member for movement relative to said other member and without opposition from said resilient means, means associated with the other of said members and providing one surface normally engaged by said latch means to prevent operation thereof to said released position below a buff force of a predetermined value and providing a recess longitudinally adjacent said surface for receiving said latch means to permit such operation to released position, means responsive to movement of said members at least a predetermined distance relatively toward each other against resistance of said resilient means upon a buff force exceeding the predetermined value to effect substantial alignment of said latch means and recess, and means for urging said latch means into said recess upon such alignment and thereby actuate said latch means to said released position.

4. A draft apparatus comprising, in combination, two telescopingly arranged members each longitudinally movable relative to the other and each operatively connectable to a respective vehicle, resilient means interposed between said members to transmit draft and buff forces between the respective vehicles, and non-breakable emergency release means including latch means normally establishing a substantially inflexible thrust connection between one of said members and one end of said resilient means during buff forces, the other of said members always being operatively acted upon by the other end of said resilient means during buff forces, means constituting part of said other member and providing a recess into which said latch means is movable only upon at least a predetermined degree of movement of said members relatively toward each other, cam means associated with at least one of said members and responsive to said predetermined degree of movement to urge said latch means in a direction generally transversely of the axis of said members and into said recess to disestablish said thrust connection and permit said members to move a further degree relatively toward each other without resistance from said resilient means, and means including means forming part of said other member for ejecting said latch means from said recess responsively to subsequent movement of said members relatively apart under a draft force to thereby reestablish said thrust connection.

5. A draft apparatus comprising, in combination, two members each longitudinally movable relative to the other and each operatively connectable to a respective vehicle, resilient means interposed between said members for normally transmitting draft and buff forces between the vehicles, and non-breakable emergency release means comprising latch means effective or ineffective to provide a substantially inflexible thrust connection between one of said members and said resilient means during buff forces according as said latch means is disposed respectively to one longitudinal side of or within a latch-means receiving recess forming part of the other of said members, said resilient means always being operatively engaged by said other member during buff forces and normally biasing said members relatively apart to provide said effective condition of said latch means, and means associated with at least one of said members to urge said latch means into said recess and to its effective condition upon generally transverse alignment of the latch means and recess responsively to movement of said members relatively toward each other a predetermined distance corresponding to a buff force exceeding a predetermined value, whereby upon such predetermined value or buff force said thrust connection will be disestablished to permit the buff force to shorten the draft apparatus.

6. A draft apparatus for connecting two vehicles and comprising, in combination, two members each movable longitudinally relative to the other and each connected to a respective one of the vechiles, resilient means interposed between said members to transmit draft and buff forces between the members and thereby the vehicles, means including latch means normally providing a substantially inflexible thrust connection between one of said members and one end of said resilient means during buff forces, stop means carried by the other of said members and always operatively contacted by the other end of said resilient means during buff forces, means forming part of said other member and providing a recess into which said latch means may project to disestablish said thrust connection and establish another connection for transmitting thrust from said one end of said resilient means via said latch means to said other member to cause said resilient means to be rendered ineffectual by operative contact at both of its ends with said other member, said other member providing a surface adjacent said recess normally contacted by said latch means for preventing entry thereof into said recess, and means operative to urge said latch means into said recess when said latch means and recess are substantially transversely aligned in consequence of a predetermined degree of movement of said members relatively toward each other responsively to a buff force exceeding a predetermined value, whereby upon disestablishment of the first-mentioned thrust connection and establishment of said other thrust connection said members can move relatively toward each other a further degree free of resistance of said resilient means and without breakage of said latch means so that upon relative movement of said members away from each other and dissipation of the excessive buff force, said latch means is repositionable to reestablish said first-mentioned thrust connection.

7. A draft apparatus comprising, in combination, two telescopingly arranged members in the form of a hollow body means and a rod means each movable longitudinally relative to the other and each connected to a respective vehicle, a tubular cage element reciprocable in a bore in said body means, a plurality of latching balls carried by said element and arranged circumferentially in respective spaced holes in said element, resilient means surrounding said rod means and compressible between a shoulder on said rod means and one end of said cage element during buff forces, and control means for selectively causing said latching balls and cage element to be detachably secured to said body means or said rod means according to whether said buff force is less than or exceeds a predetermined value, said control means including a recess provided in said rod means into which said balls are moved when said recess and balls are substantially longitudinally aligned responsively to a buff force exceeding said predetermined value to detachably secure said latching balls and cage element to said rod means, and removed from said recess when a draft force is applied after dissipation of said excessive draft force to reposition and detachably secure said latching balls and cage element to said body means.

8. A draft apparatus for connecting two vehicles and comprising, in combination, body means providing a beveled cam surface, rod means projecting into said body means and providing a stop shoulder spaced longitudinally from its projecting end, means for connecting the body means and rod means to respective ones of the vehicles, said rod means including near said projecting end a latch release portion comprising a cylindrical surface and an adjoining recess, annular cage means surrounding said cylindrical surface and surrounded by said body means, resilient means surrounding said rod means and operatively compressed between said stop shoulder and the adjacent end of said cage means upon movement of said rod means and body means relatively toward each other during buff forces, and a plurality of balls carried by said cage means and biased by said resilient means into latching contact with said cam surface during buff forces so long as said balls contact said cylindrical surface, and when buff force attains a predetermined value sufficient to cause said recess to become substantially transversely aligned with said balls said cam surface be-

ing cooperative with said cage means to produce a resultant force effective to deflect said balls out of contact with said cam surface and into said recess, whereby upon buff forces exceeding said value the cage means will be locked by said balls to said rod means and unlocked from said body means thereby permitting further movement of said rod means and body means toward each other without resistance from said resilient means, said recess at its end adjacent said cylindrical surface being defined in part by another beveled cam surface which, under a subsequent draft force and consequent movement of said rod means and body means relatively apart, cooperates with said cage means to provide a resultant force operative to deflect said balls out of said recess and into an opening in said body means adjacent the first-named cam surface upon transverse alignment of said balls substantially with said opening, thereby to restore the draft apparatus to normal condition without requiring replacement of components.

9. A draft apparatus for connecting two vehicles and comprising, in combination, two members each movable longitudinally relative to the other and each connected to a respective one of the vehicles, resilient means interposed between said members to transmit draft and buff forces between the members and thereby the vehicles, means including latch means being movable responsively to draft and buff forces transmitted through said resilient means between a latch position corresponding to the normal draft position of said members and an unlatched position, said latch means in said normal draft position providing a substantially inflexible thrust connection between one of said members and one end of said resilient means during buff forces, stop means carried by the other of said members and always operatively contacted by the other end of said resilient means during buff forces, means providing a recess into which said latch means may project to disestablish said thrust connection responsively to movement of said members a predetermined distance relatively toward each other against resistance of said resilient means due to a buff force exceeding a predetermined value and sufficient to cause said recess and latch means to be brought into substantially transverse alignment, and cam means associated with said one member and engaged by said latch means during buff forces and cooperable with said resilient means to cause said latch means to be cammed into said recess upon such alignment, whereby upon a buff force exceeding said predetermined value the draft apparatus will be shortened by the unlatching of said resilient means from operative contact with said one member.

10. A draft apparatus for connecting two vehicles and comprising, in combination, telescopingly arranged body means and rod means each connectable to a respective one of the vehicles, annular cage means reciprocable in a bore in the body means and surrounding said rod means, a plurality of balls arranged in a ring and carried in holes in said cage means and normally contacting said bore and a reduced diameter part of said rod means, resilient means surrounding the rod means and during buff forces providing a resilient buff connection between a stop shoulder provided in said body means and the adjacent end of said cage means, and cam means carried by said rod means and acting through said balls and cage means to provide a substantially rigid thrust connection between said rod means and resilient means during buff forces so long as said balls contact said bore, said cam means being operatively responsive to a predetermined movement of said rod means relatively toward said body means under a buff force exceeding a predetermined value to eject said balls out of contact with said part and into a recess in said body means adjacent said bore thereby to disestablish said thrust connection and permit further movement of said rod means toward said body means, said recess being in part defined by a beveled cam surface which, under a subsequent draft force and consequent movement of said rod means outwardly relative to the body means, cooperates with said cage means to provide a resultant force effective to deflect said balls out of said recess and into contact with said reduced diameter part upon transverse alignment of said balls substantially with said part, thereby to restore the draft apparatus to normal condition without requiring replacement of components.

11. A draft apparatus for connecting two vehicles and comprising, in combination, telescopingly arranged body means and rod means each connectable to a respective one of the vehicles, latch means having a pivotal spring-biased connection with said rod means, resilient means surrounding said rod means and compressible between a stop surface in said body means and said latch means responsively to movement of said rod means inwardly relative to said body means during buffing forces, said body means providing a cam surface normally engaged by said latch means to maintain the latter in operative contact with said resilient means, said body means also providing a recess defined in part by a thrust surface adjacent said cam surface, said latch means being biased to project expansively into said recess upon such inward movement of said rod means under a buff force exceeding a predetermined value for causing said latch means to contact said thrust surface and thereby permit said rod means to move further inwardly without resistance from said resilient means which will now be rendered ineffectual by being compressed between said stop surface and thrust surface.

12. A draft apparatus extending between a tractor and a trailer vehicle comprising telescoping members axially movable relatively to each other between a normal extended draft position and a shortened buff position, each of said members including means adapted to be connected to said tractor and trailer, respectively, cushioning means axially interposed between said members to provide a resilient connection therebetween and operative in said normal draft position for transmitting the draft forces and buff forces below a predetermined value therethrough, and latch means operatively connected to said cushioning means and being movable between a latch position for holding said telescoping members for limited relative axial movement in said normal draft position and an unlatched position for releasing said telescoping members from said draft position to said buff position, said latch means being movable to said unlatched position in response to buff forces above said predetermined value transmitted through said cushioning means and being returnable to said latch position upon the dissipation of said predetermined value of buff forces and the application of a draft force through said cushioning means.

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