

966,495.

5 SHEETS—SHEET 1.



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DRAFT RIGGING FOR RAILWAY CARS.
APPLICATION FILED MAY 7, 1908.

966,495.

Patented Aug. 9, 1910.

5 SHEETS—SHEET 2.

Fig. 3.

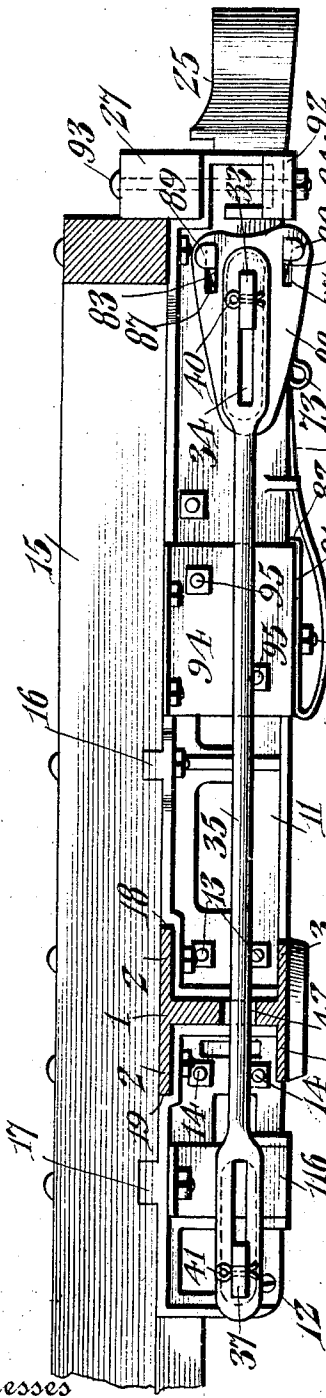


Fig. 13.

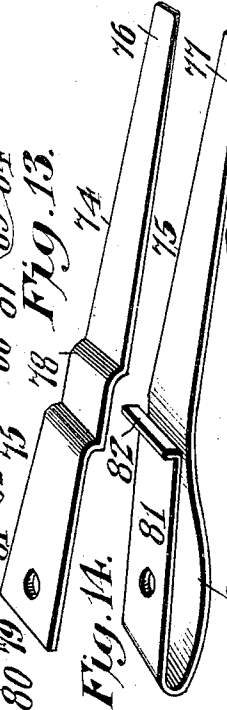


Fig. 14.

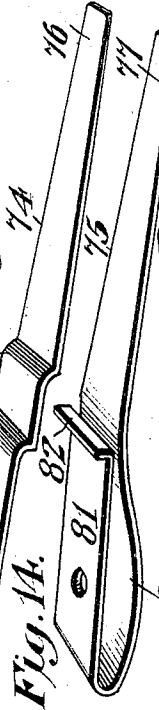


Fig. 12.

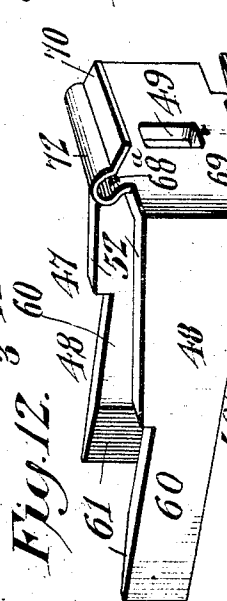
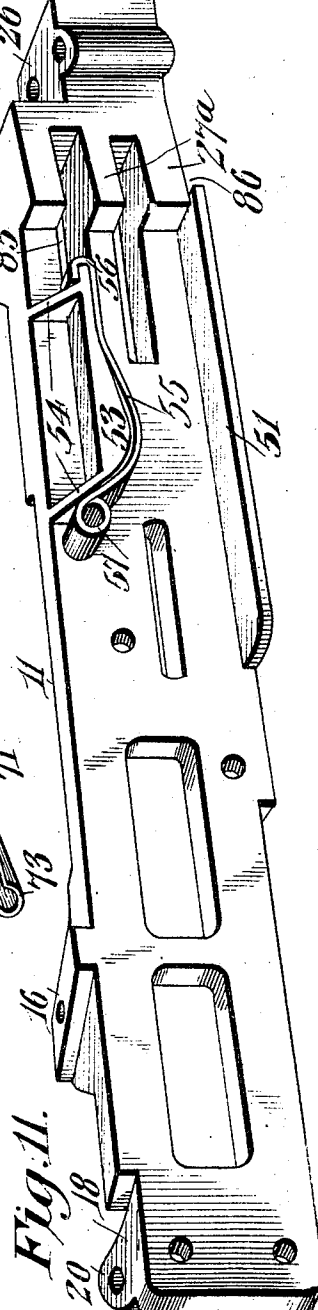


Fig. 11.



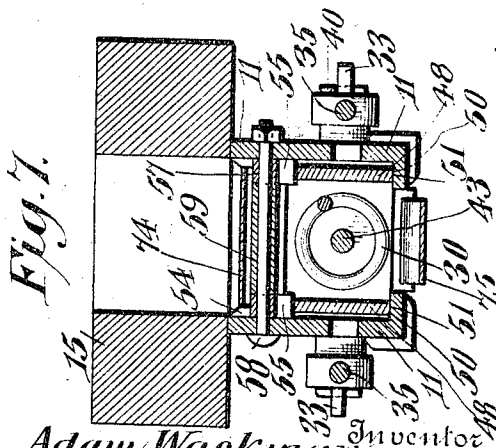
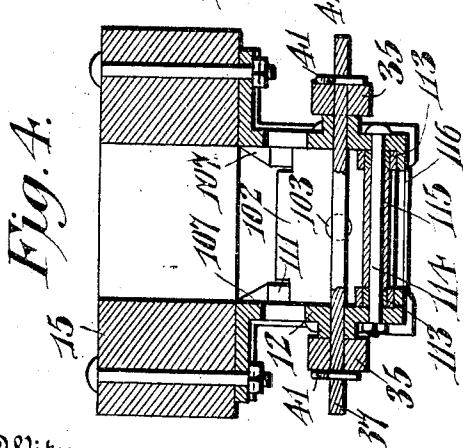
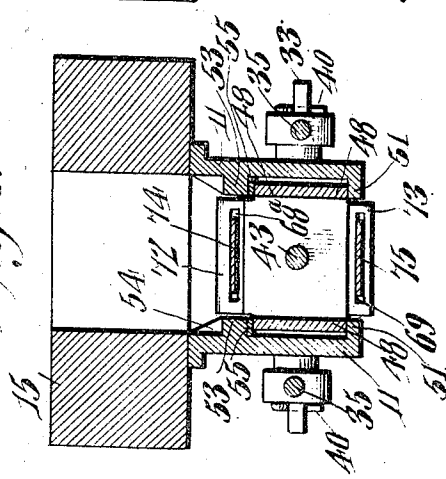
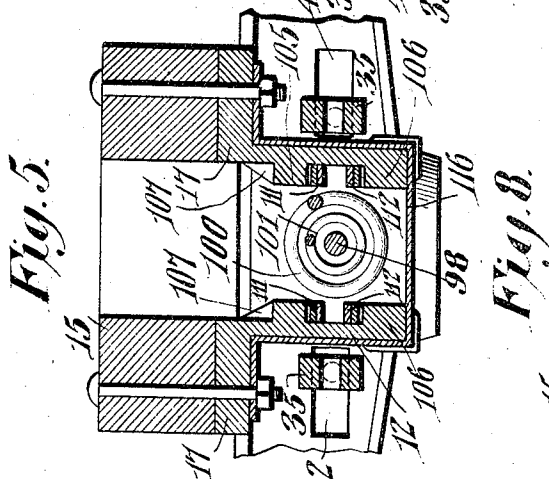
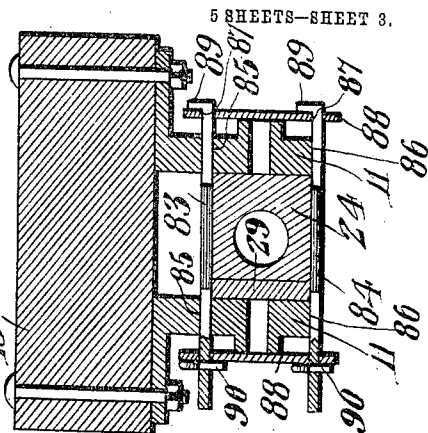
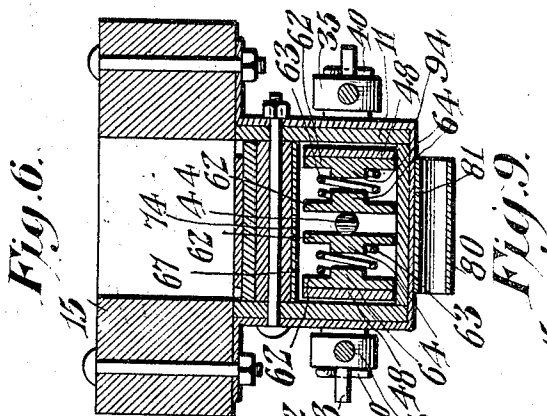
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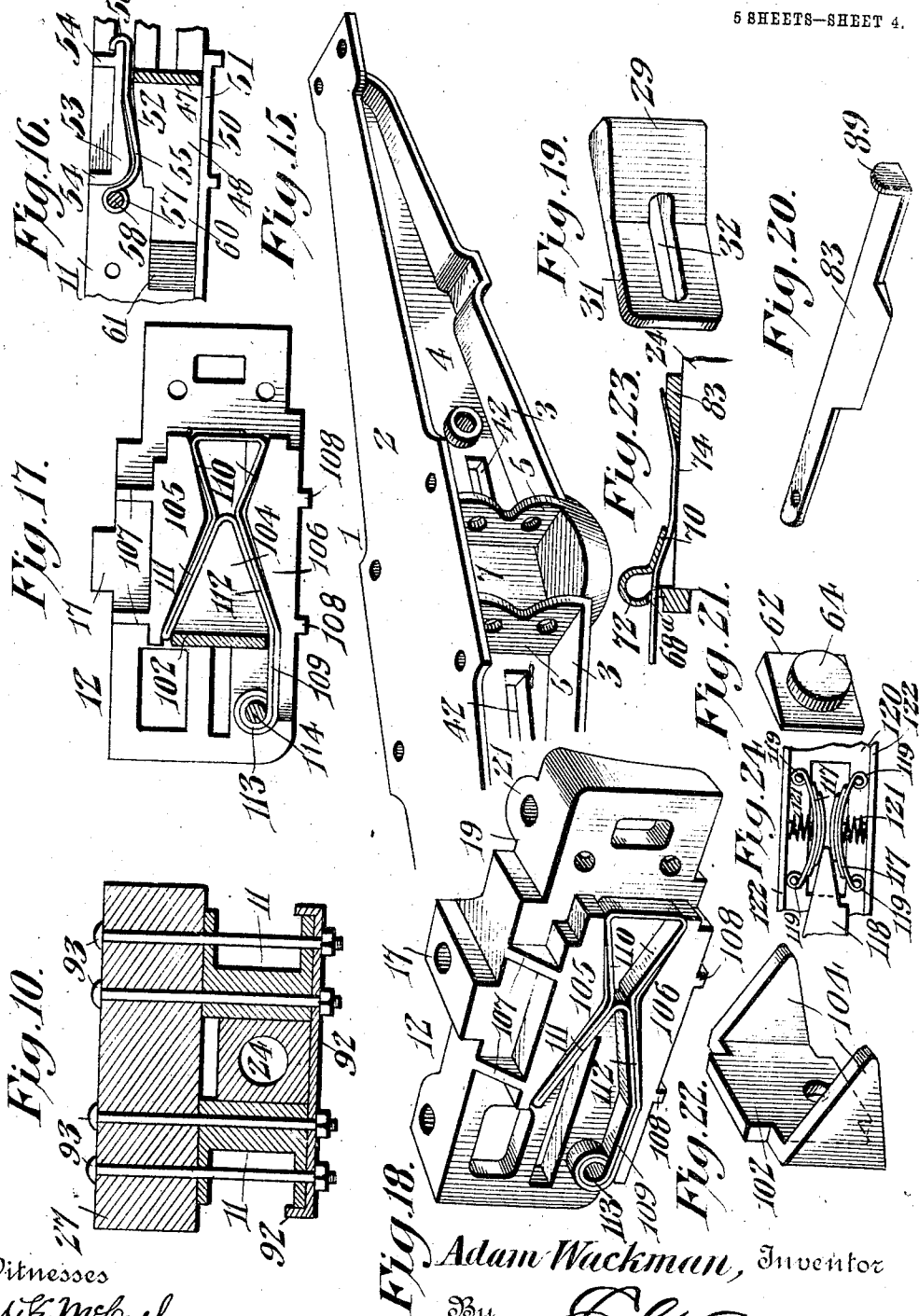
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6 SHEETS—SHEET 5.

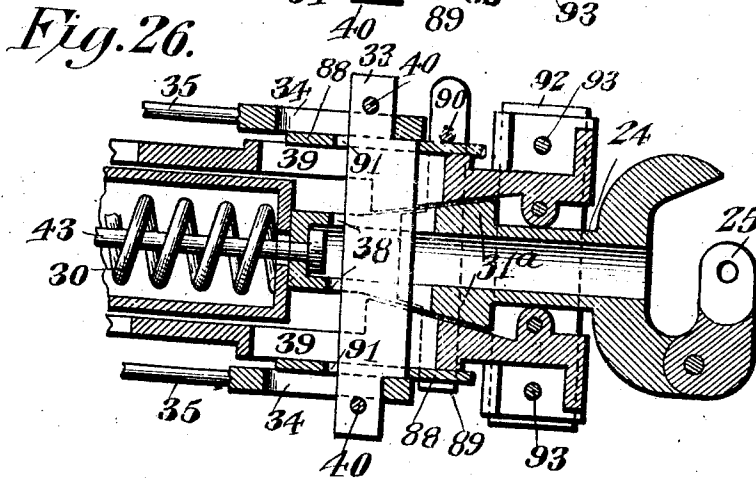
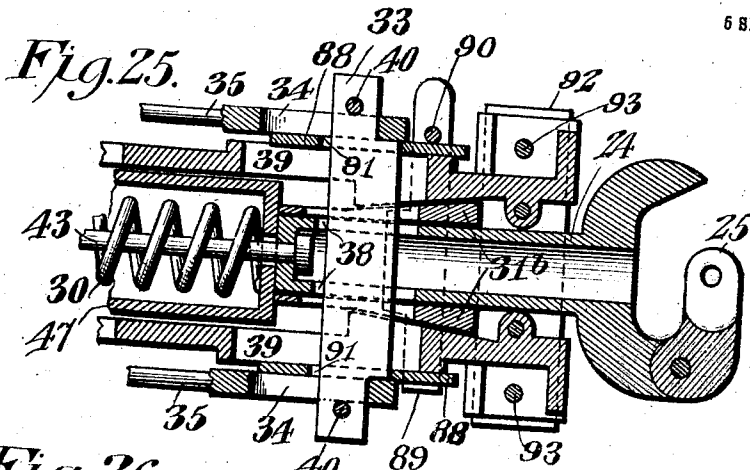
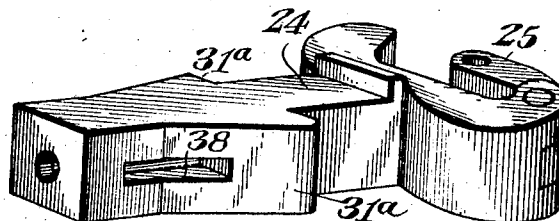


Fig. 27.



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UNITED STATES PATENT OFFICE.

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DRAFT-RIGGING FOR RAILWAY-CARS.

966,495.

Specification of Letters Patent.

Patented Aug. 9, 1910.

Application filed May 7, 1908. Serial No. 431,378.

To all whom it may concern:

Be it known that I, ADAM WACKMAN, a citizen of the United States, residing at St. Louis, State of Missouri, have invented a new and useful Draft-Rigging for Railway-Cars, of which the following is a specification.

The invention relates to improvements in draft rigging for railway cars.

The object of the present invention is to improve the construction of draft rigging for railway cars, more especially the draft rigging shown and described in Patent No. 779,012, granted to me Jan. 3, 1905, and to provide a simple and comparatively inexpensive draft rigging of increased strength and durability, adapted to absorb the shocks and minimize their effect on the car, and thereby reduce the cost of repairs to a minimum.

A further object of the invention is to provide draft rigging of this character, equipped with frictional devices adapted to first retard and then finally check the inward or rearward movement of the draw bar to prevent the buffing spring or springs from being entirely compressed or deadened, thereby increasing the life and efficiency of the same.

Another object of the invention is to provide means for checking and limiting the outward or forward movement of the draft mechanism to prevent the rear pulling spring or springs from entirely collapsing and becoming deadened and liable to fracture.

The invention also has for its object to strengthen the draft rigging particularly at the center of the body bolster, and to provide a construction adapted to admit of a bolster having a solid center.

With these and other objects in view, the invention consists in the construction and novel combination of parts hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended; it being understood that various changes in the form, proportion, size and minor details of construction, within the scope of the claims, may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings:—Figure 1 is a longitudinal sectional view of a portion of a car equipped with draft rigging, constructed in

accordance with this invention. Fig. 2 is a horizontal sectional view of the same. Fig. 3 is a side elevation of the draft rigging, a portion of the frame of the car and the body bolster being in section. Fig. 4 is a transverse sectional view on the line 4—4 of Fig. 1. Fig. 5 is a transverse sectional view on the line 5—5 of Fig. 1. Fig. 6 is a transverse sectional view on the line 6—6 of Fig. 1. Fig. 7 is a transverse sectional view on the line 7—7 of Fig. 1. Fig. 8 is a transverse sectional view on the line 8—8 of Fig. 1. Fig. 9 is a transverse sectional view on the line 9—9 of Fig. 1. Fig. 10 is a transverse sectional view on the line 10—10 of Fig. 1. Fig. 11 is a perspective view of one of the front draft beams. Fig. 12 is a detail perspective view of the front follower. Fig. 13 is a detail perspective view of the upper longitudinal spring. Fig. 14 is a similar view of the lower longitudinal spring. Fig. 15 is a detail perspective view of a portion of the body bolster. Fig. 16 is a sectional view, taken substantially on the line 16—16 of Fig. 2, and illustrating the arrangement of the sides of the front follower with relation to the cooperating portions of the front side beams. Fig. 17 is a similar view, taken substantially on the line 17—17 of Fig. 3, illustrating the arrangement of the rear follower with relation to the cooperating portions of the rear draft beams. Fig. 18 is a detail perspective view of one of the rear draft beams. Fig. 19 is a detail perspective view of the front slidable side friction plate or member. Fig. 20 is a detail view of one of the transverse friction bars or members. Fig. 21 is a detail perspective view of one of the laterally movable friction blocks or members. Fig. 22 is a detail perspective view of the rear follower. Fig. 23 is an enlarged detail sectional view of the front portion of the upper longitudinal spring, the upper spring engaging means of the front follower, and the upper transverse friction bars. Fig. 24 is a detail view, illustrating a modification of the invention. Fig. 25 is an enlarged horizontal sectional view, illustrating another form of the invention. Fig. 26 is a similar view showing still another form of the invention. Fig. 27 is a detail perspective view, illustrating the construction of the shank or draw bar shown in Fig. 26.

Like numerals of reference designate cor-

responding parts in all the figures of the drawings.

The body bolster 1 of the draft rigging, like that shown and described in the said patent, consists preferably of a single integral casting, and is composed of a top plate or member 2, a bottom plate or member 3, and a central vertical connecting web 4. The web and the bottom plate or member are increased in thickness at the center of the body bolster, as clearly illustrated in Figs. 1 and 2 of the drawings, and the said bolster is provided at opposite sides of the center with vertical flanges 5 and 6, forming front and rear sockets 7 and 8 for the reception of the rear end of a front wooden filler block 9 and a rear wooden filler block 10. The front and rear vertical webs are also provided for the attachment of front and rear draft beams 11 and 12, secured to the said flanges 5 and 6 by transverse bolts 13 and 14, which also pierce the filler blocks.

The body bolster and the front and rear draft beams, which are rigidly connected together, are bolted to the frame-work of the car in the manner set forth in the said patent, the draft beams being provided with suitable bolting flanges and bosses 16 and 17, which are let into the sills. The inner or rear ends of the front draft beams are recessed at 18, and are fitted into the space between the upper and lower plates or members of the body bolster in advance of the central connecting web, and the front ends of the rear draft beams are provided with corresponding recesses 19 to fit within the body bolster in rear of the central connecting web. This arranges the upper faces of the draft beams and the body bolster in flush relation, and the proximate ends of the front and rear draft beams are provided at the said recesses with bolting flanges 20 and 21, secured to the inner face of the top plate or member of the body bolster by bolts 22 and 23, which also pierce the adjacent sills for securing the bolster to the same.

The front draft beams, which are spaced apart to receive the draw bar 24 of a coupler or draw head 25, are recessed at the upper portions of their front edge 26 to receive a bumper block 27, and are provided at their inner faces with forwardly or outwardly tapered approximately triangular enlargements 27^a, presenting inwardly or rearwardly converging angularly disposed side faces and adapted to be engaged by wedges 28 and 29, located at opposite sides of the draw bar and tapered inwardly or rearwardly and adapted to retard and check the inward or rearward movement of the said draw bar to prevent injury to the buffing spring 30.

The draft rigging may be equipped with one or more buffing springs, and in practice, while buffing, a buffing spring closes or compresses about three inches, and when fully

compressed and deadened is liable to be broken. The wedge for producing friction at the sides of the draw head and the other devices hereinafter described for producing friction are designed to first retard the inward movement of the draw bar and then finally check such movement before the buffing spring is fully closed or compressed, say within one-half an inch of complete compression. This will prevent the buffing spring from becoming deadened and will materially increase the life of such spring, and the friction devices also operate to absorb the jars and shocks and minimize their effect on the car structure and reduce the cost of repairs.

When the buffing spring is in its normal condition, that is, neither distended nor compressed, there is sufficient space between the wedges 28 and 29 and the cooperating surfaces to permit the said inward movement of the draw bar. This space admits of a limited lateral movement of the draw bar, which lateral movement increases as the draw bar is drawn outward through the distention of the buffing spring.

The wedge 28, which is formed integral with the draw head, consists of a substantially triangular enlargement and presents an inclined angularly disposed face to the adjacent enlargement or wedge 27 of the proximate draft beam. The other side wedge 29 consists of a rearwardly tapered front portion of a movable friction plate or member 31, located at the opposite side of the draw bar and provided with a longitudinal slot 32, through which passes a front cross head 33, which connects the front slotted ends 34 of a pair of draft rods 35. The draft rods 35 are located at opposite sides of the draft beams and on the exterior of the same, and they are provided with rear slotted ends 36, which are connected by a rear cross head 37. The front cross head 33 extends through slots 38 and 39 of the draw bar and the draft timbers, and when the draw head is forced inwardly or rearwardly, it carries with it the front cross head and the slidable side plate or member 31. The slot 32 of the side plate or member permits the latter to yield or stop while the draw bar moves inward or rearward independently of the said side plate or member, so that the draw bar will not become locked until the buffer spring is nearly compressed. The arrangement of the slidable plate or member 31 at one side of the draw bar and the integral wedge at the opposite side of the draw bar is preferred, but the side friction on the draw bar may be increased by making both of the movable wedges 31^a integral with the draw bar, as illustrated in Figs. 26 and 27 of the drawings, and a corresponding reduction of the side friction may be obtained by constructing both of the

movable wedges 31^b separate from and slidable with respect to the draw bar, as shown in Fig. 25 of the drawings.

The terminals of the front and rear cross heads are reduced to form shoulders for engaging the slotted ends of the draft rods, which are secured on the reduced ends of the cross heads by means of front and rear keys 40 and 41. The vertical web of the body bolster is provided at opposite sides of the central sockets with slots 42 through which the draft rods pass.

The draw bar is equipped at its rear end with a tail pin 43, piercing the rear end of the draw bar and provided with a head arranged within the same, but the tail pin may be secured to the rear end of the draw bar in any preferred manner. The tail pin, which is provided with a rearwardly tapered or wedge-shaped rear end 44, extends rearwardly to the front or outer end of the front filler block 9, which is reinforced at its front end by an angle metallic face plate 45, fitted against the upper face and the front end of the filler block 9, as clearly illustrated in Fig. 1 of the drawings. The upper face of the said block 9 is recessed to receive the upper portion of the angle face plate, which is arranged in flush relation with the top of the filler block. A bottom metallic face plate 46 is secured to the lower face of the front filler block and extends from the body bolster to the vertical front portion of the angle face plate. The buffer spring 30, which is disposed on the tail pin, is interposed between the outer or front end of the filler block 9, and the rear end of the draft bar, a front follower 47 being fitted against the rear or inner end of the draw bar and the front or outer end of the buffer spring. The front follower 47 is composed of two sides 48 and a front connecting transverse portion having a slot 49, through which the tail pin passes. The lower edges 50 of the sides of the front follower are horizontal and slide upon horizontal guide and supporting flanges 51, formed integral with the front draft beams and extending inwardly therefrom at the lower edge thereof, as clearly shown in Fig. 11 of the drawings. The upper edges 52 of the front portions of the sides are inclined downwardly and rearwardly and are arranged to frictionally engage downwardly and rearwardly inclined faces of upper longitudinal flanges 53, formed integral with the draft beams and tapered forwardly and reinforced by bracing ribs 54, also formed integral with the draft beams and located above the longitudinal flanges 53. In order to avoid wearing the lower inclined faces of the upper flanges 53, the latter are equipped with springs 55 located beneath and extending longitudinally of the flanges 53 and having their front ends 56 bent upon themselves to form hook-

shaped portions for engaging the front or outer ends of the upper flanges. The rear portions of the springs 55 are extended upwardly and are coiled or rolled to form eyes 57, through which passes a transverse bolt 58. The transverse bolt 58 pierces the front draft beams and supports a spacing sleeve 59, which is interposed between the eyes of the rear ends of the springs 55, as clearly shown in Fig. 7 of the drawings. The springs are removable and are adapted to be replaced by new springs when worn, and by subjecting the springs to the wear, the draft beams do not have to be discarded through wear of the flanges or enlargements. When the front follower is moved rearwardly, the inclined upper edges 52 engage the springs 55, creating friction and finally resulting in checking the inward or rearward movement of the draw bar.

The rear or inner portions 60 are laterally tapered to present inner angularly disposed side faces 61, and are frictionally engaged by the laterally movable friction blocks or members 62, operating in a transverse recess 9^a of the lower portion of the front end of the filler block 9. The laterally movable friction blocks or members, which are tapered forwardly, are arranged in pairs, which are located at opposite sides of the tapered inner or rear end of the tail pin of the draw bar. Coiled springs 63 are interposed between the members of each pair of laterally movable friction blocks or members, which are provided at their inner faces with integral studs 64, fitted within and braced by the end coils of the springs 63, which are disposed transversely of the draft rigging. The inward or rearward movement of the tail pin and the front follower results in compressing the coiled springs 63 of the laterally movable friction blocks or members 62, and friction is thereby created to resist the inward or rearward movement of the draw head. The vertical portion of the angle metallic face plate 45 is provided with an opening 65 for the passage of the tail pin, and the front filler block 9 is provided in the rear vertical wall of the recess 9^a with a socket 66, forming an extension or branch of the recess to provide a passage way for the tapered rear end of the tail pin. The walls of the recess 9^a are reinforced by an angle wear plate 67, composed of a horizontal and a vertical portion, the vertical portion being provided with an opening 68, registering with the socket or extension 66 of the recess 9^a.

The front follower is provided at the top and bottom with slots 68^a and 69, and it has forwardly or outwardly converging inclined lips or flanges 70 and 71, disposed transversely of the follower and connected with the upper and lower edges of the transverse portion by spring bends 72 and 73. The 130

slots or openings 38^a and 69 receive upper and lower longitudinal springs 74 and 75, designed to be constructed of any desired strength and secured to the filler block at the top and bottom thereof, and provided with front engaging portions 76 and 77, which are tapered or wedge-shaped. The upper lip or flange 70 extends downwardly and forwardly, and the lower lip or flange 71 extends upwardly and forwardly, and when the follower moves rearwardly, the upper and lower longitudinal springs are forced against the top and bottom of the draw head with great force, the friction being increased by the resiliency of the spring bends. The inner or rear portion of the longitudinal spring 74 is angularly bent to fit against the angular wear plate 45 of the filler block, and it has an off-set or bend 78 in advance of the filler block, which permits the spring to yield to prevent any liability of shearing the bolt 79 for securing the springs to the filler block. Although only one bolt is shown in the accompanying drawings, it will be readily understood that a plurality of fastening devices may be employed. The lower longitudinal spring 75 is provided at its rear portion with a bend 80 to permit the spring to yield to avoid shearing the bolt 79, and it has a forwardly extending arm 81 terminating in a lip or flange 82 and secured to the lower wear plate 46 of the filler block at the front portion thereof.

In order to further increase the friction resulting from the employment of the upper and lower longitudinal springs, the draft mechanism is equipped with upper and lower transversely disposed friction bars 83 and 84, tapered or wedge-shaped in cross section and located at the upper and lower faces of the draw bar. The transverse friction bars are tapered inwardly or rearwardly and they engage the front tapered or wedge-shaped ends 76 and 77 of the longitudinal springs, being interposed between the same and the draw bar, and when the cross bars are moved rearwardly with the draw bar, they force the front portions of the springs outwardly, thereby increasing the tension of the springs and the friction produced by the same at the top and bottom of the draw bar.

The upper and lower transverse friction bars are provided with reduced end portions, and the upper friction bar extends through slots 85 of the draft beams, and the lower friction bar operates in lower recesses 86 of the draft beams. The end portions of the transverse friction bars also extend through upper and lower slots 87 of the side connecting or draw plates 88, and are equipped at one of the side plates with projecting lugs 89 and are perforated at the other end for the reception of keys 90. The side plates are located at opposite sides

of the draft rigging between the draft beams and the draft rods, and the lugs and the keys retain the ends of the transverse friction bars in the slots of the draw or connecting plates. The draw or connecting plates are also provided with intermediate slots 91 for the reception of the front cross head 33. By connecting the upper and lower transverse friction bars or members with the front cross head, they are carried rearward or inward with the draw bar.

The friction at the top, bottom and sides of the draw bar and at the rear end of the tail pin and the sides of the front follower bar and tends to absorb the shocks and jars, while the wedges at the opposite sides of the draw bar and at the upper edges of the sides of the follower serve to positively check the inward or rearward movement of the draw head before the coiled buffing spring is completely closed or compressed.

The draw bar is supported at the front by a carrier iron 92, which is secured at its terminals to the lower faces of the front ends of the draft beams by bolts 93. The parts are strengthened and reinforced by a clamping yoke 94, embracing the draft beams at the front portion of the filler block 9 and secured to the car structure at opposite sides of the draft bars. The sides of the clamping yoke are secured to the draft beams by transverse bolts 95, which pierce the front portion of the filler block 9, as clearly shown in Figs. 1 and 3 of the drawings. The clamping yoke and the reinforcing wear plates provide a structure characterized by great strength.

The inner or rear end of the filler block 9 is reduced to fit the front socket 7 of the bolster, and the rear filler block 13, which is reinforced by a transversely disposed wear plate 96, fits within the rear socket and is provided with an opening 97 for the front end of a guide rod 98. The reinforcing or wear plate 96, which is composed of side portions and a transverse connecting portion, is provided in the latter with an opening 99, registering with the opening of the rear filler block 97. Coiled pulling springs 100 and 101, which are interposed between the rear filler block and a rear follower 102, are disposed on the guide rod 98. The pulling spring 100 is larger and stronger than the spring 101, which is arranged within the spring 100, as clearly shown in Figs. 1 and 5 of the drawings. The rear end of the guide rod pierces the rear follower 102, and is provided with a head 103. When the draw head is pulled outward, it carries with it the draft rods 35, which move the rear cross head forward and compress the pulling springs 100 and 101. The draft rigging is equipped with means for preventing the pulling springs from being entirely com-

pressed or closed. The rear follower is provided with approximately triangular sides 104, forming forwardly tapered wedges and operating in tapering recesses of the rear draft beams. The rear draft beams are provided at their inner faces with integral upper and lower approximately triangular flanges or enlargements 105 and 106, presenting oppositely inclined lower edges and forming front and rear tapering recesses. 10 The upper flanges or enlargements are reinforced by strengthening webs 107, disposed transversely of the upper faces of the flanges or enlargements and extending upwardly 15 therefrom, as clearly shown in Fig. 18 of the drawings. The lower flanges or enlargements are reinforced by transverse ribs 108, extending across the lower faces of the lower flanges or enlargements and the lower edges 20 of the draft beams.

The tapered sides of the rear follower are arranged in the rear forwardly tapered recesses, formed by the flanges or enlargements 105 and 106, and the rear draft beams 25 are equipped with springs 109, each consisting of a front approximately triangular loop 110 and rearwardly diverging upper and lower sides 111 and 112. The front loop 110 is arranged in the front recess formed by 30 the upper and lower flanges or enlargements 105 and 106, and the rearwardly diverging sides 111 and 112 are located in the rear recess formed by the said flanges or enlargements 105 and 106. The sides 111 and 112 35 are preferably composed of two leaves or thicknesses, and they prevent the flanges or enlargements 105 and 106 from being worn by the rear follower. Each spring is preferably constructed of a single strip of resilient material, which is bent intermediate 40 of its ends to form the triangular loop 110. One portion of the material is then extended from one side of the loop to form one of the leaves of the lower side 109, and the material at the other side of the loop 110 is extended and doubled or bent back on itself 45 to provide the upper side 111 and is then extended rearwardly to form the upper leaf of the lower side 109 and complete the 50 spring. The lower side 109 is provided at its rear end with an eye 113, formed by rolling or coiling the material and receiving a transverse bolt 114. When the springs become worn, they may be readily removed 55 and replaced by new springs. The springs are held against lateral movement on the bolt by means of a spacing sleeve 115, arranged on the bolt 114 and interposed between the eyes 113 of the rear side springs 60 109. The forward tapering sides or wedges of the rear follower are limited in their forward movement by the walls of the rear recesses of the flanges or enlargements 105 and 106, and the outward movement of the 65 draw head is checked before the pulling

springs are completely compressed or deadened. The rear draft beams are embraced at an intermediate point by a rear clamping yoke 116, secured at the upper terminals of its sides to the flanges of the rear draft 70 beams.

In Fig. 24 is illustrated a modification of the invention, showing upper and lower leaf springs 117, arranged to present convex 75 faces to a tapered follower 118, having upper and lower inclined edges or faces and adapted to spread or separate the leaf springs. The leaf springs, which are equipped with terminal eyes 119, are suitably secured to a draft beam 120, and they 80 may be reinforced by centrally arranged coiled springs 121, interposed between the leaf springs and upper and lower flanges 122 of the draft beam 120.

The leaf springs and the bracing coils are 85 designed to be substituted for the enlargements or flanges, and may be employed in connection with either the front or rear follower or both.

Having thus fully described my invention, 90 what I claim as new and desire to secure by Letters Patent, is:—

1. A draft rigging comprising spaced draft beams, a coupler head having a shank slidable between the draft beams, a buffer 95 spring arranged in rear of the shank for cushioning the same, and means for checking the inward movement of the shank, said means being located at an intermediate point between the ends of the shank and including a wedge-shaped member formed integral 100 with the shank and arranged to engage the adjacent draft beam.

2. A draft rigging including spaced draft beams, a coupler head having a shank slidable 105 between the draft beams, a buffer spring located in rear of the shank for cushioning the same, and means for checking the inward movement of the shank, said means being located at an intermediate point 110 between the ends of the shank and comprising cooperating members arranged in pairs and having angularly disposed faces adapted to wedge the shank, one of the said members being slidable on the shank and another 115 member being formed integral with the same.

3. A draft rigging including spaced draft beams, a coupler head having a shank slidable 120 between the same, a buffer spring located in rear of the shank to cushion the latter, fixed wedge-shaped members located at opposite sides of the shank between the ends thereof, and cooperating wedge-shaped members actuated directly by and movable 125 with the shank and arranged to engage the fixed wedge-shaped members, said members being mounted independently of the buffer spring.

4. A draft rigging including a draw bar, 130

- a spring for cushioning the same, a follower connected with the draw bar and having an inclined face, yieldable means arranged to engage the inclined face of the follower to retard the inward movement of the draw bar, and fixed means arranged in the path of the inclined face of the follower to limit positively the movement thereof before the spring is entirely closed.
5. A draft rigging including a draw bar, a follower connected with the draw bar and having spaced sides provided with inclined faces, a buffer spring arranged between the sides of the follower for cushioning the draw bar, yieldable means arranged to engage the inclined faces of the follower to retard the inward movement of the draw bar, and fixed means arranged in the path of the inclined faces to positively limit the inward movement of the follower.
6. A draft rigging including a draw bar, means for cushioning the same, a follower provided with a tapered or wedge-shaped portion, and a draft beam provided with a fixed inclined face arranged in the path of and cooperating with the tapered or wedge-shaped portion of the follower to check and limit the inward movement of the draw bar.
7. A draft rigging including a draw bar, a spring arranged in rear of the draw bar for cushioning the same, a follower connected with the draw bar and having spaced sides receiving the spring between them, and draft beams slidably receiving the follower and provided with opposite enlargements presenting inclined faces to the follower for checking and limiting the inward movement of the same before the spring is entirely closed.
8. A draft rigging including a draw bar, means for cushioning the same, a follower provided at opposite sides with tapered portions having inclined faces, and draft beams slidably receiving the follower and provided with inclined faces arranged in the path of the inclined faces of the follower.
9. A draft rigging including a draw bar, means for cushioning the same, a follower provided at opposite sides with tapered or wedge-shaped portions having inclined faces, and draft beams provided with lower horizontal flanges for supporting the follower and having tapered upper enlargements or flanges presenting inclined faces to the follower for checking and limiting the inward movement of the draw bar.
10. A draft rigging including a draw bar, means for cushioning the same, a follower, a draft beam having a tapered enlargement or flange arranged in the path of the follower, and a spring extending longitudinally of the flange or enlargement and arranged to protect the same from wear.
11. A draft rigging including a draw bar, means for cushioning the same, a follower, a draft beam having a tapered enlargement or flange arranged in the path of the follower and presenting a lower inclined edge to the same, a spring arranged beneath and extending longitudinally of the flange or enlargement and provided with a hook-shaped end for engaging the same, and means for supporting the other end of the spring.
12. A draft rigging including a draw bar, means for cushioning the same, a follower, draft beams provided with flanges or enlargements presenting inclined faces to the follower, springs extending longitudinally of the flanges or enlargements and connected at one end with the same and provided at the other end with eyes, a transverse fastening device piercing the draft beams and passed through the said eyes, and spacing means carried by the fastening device for engaging the eyes.
13. A draft rigging including draft beams provided with fixed inner angularly disposed faces and having fixed inclined faces, a draw bar, wedge-shaped members located at opposite sides of the draw bar at points intermediate of the ends of the latter and engaging the angularly disposed faces of the draft beams, means for cushioning the draw bar, and a follower having inclined faces cooperating with the inclined faces of the draft beams.
14. A draft rigging including a draw bar, means for cushioning the same, a follower having spaced sides rigid with each other and connected at the front with and actuated by the draw bar, said sides being provided with wedge-shaped portions forming inner angularly disposed faces, wedge-shaped blocks or members located between the sides of the follower and movable laterally of the same to engage the said angularly disposed faces, and yieldable means for actuating the said blocks or members.
15. A draft rigging including a draw bar, means for cushioning the same, a follower provided with spaced sides rigid with each other and having tapered or wedge-shaped portions, laterally movable blocks or members located between and operating against the inner faces of the sides of the follower and having studs, and coiled springs receiving the studs and actuating the blocks or members.
16. A draft rigging including a draw bar, means for cushioning the same, a follower provided with spaced sides having inner angularly disposed faces, springs arranged between the sides of the follower, and means actuated by the said springs for engaging the angularly disposed faces of the sides of the follower.
17. A draft rigging including a draw bar provided with a tail pin, a follower having sides spaced from the tail pin, and yieldable

laterally movable members located between the tail pin and the sides of the follower for engaging the same for retarding the inward movement of the draw bar.

18. A draft rigging including a draw bar provided with a tail pin having a tapered inner end, a follower having sides spaced from the tail pin and provided with tapered portions, laterally movable wedge-shaped blocks or members arranged in pairs and engaging the tapered portions of the tail pin and the follower, and springs for actuating the blocks or members.

19. A draft rigging including a draw bar, a tail pin extending rearwardly from the draw bar and having angularly disposed faces, a buffer spring arranged on the tail pin, a follower having spaced sides provided with angularly disposed faces, and yieldable laterally movable means interposed between and engaging all of said angularly disposed faces for retarding the inward movement of the draw bar.

20. A draft rigging including a draw bar, a tail pin extending rearwardly from the draw bar and having angularly disposed faces, a buffer spring arranged on the tail pin, a follower having spaced sides provided with angularly disposed faces, laterally movable wedge-shaped blocks or members arranged to engage the angularly disposed faces of the tail pin and the follower, and springs for actuating the blocks or members.

21. A draft rigging including a draw bar, a spring for engaging the draw bar, a follower, and means carried by the follower for moving the spring inwardly toward the draw bar when the follower moves inward thereby retarding the inward movement of the same.

22. A draft rigging including a draw bar, a longitudinal spring arranged to engage the draw bar, a follower, and means carried by the follower and set at an angle for forcing the spring into engagement with the draw bar when the follower moves inwardly.

23. A draft rigging including a draw bar, a spring arranged to engage the draw bar, and a follower provided with a lip or flange set at an angle and engaging the spring and arranged to force the same inwardly into engagement with the draw bar.

24. A draft rigging including a draw bar, a follower having an opening and provided with an angularly disposed portion, and a spring extending through the opening of the follower and engaged by the angularly disposed portion of the same, whereby it is forced inward into engagement with the draw bar when the follower is moved inwardly.

25. A draft rigging including a draw bar, a follower provided at the top and bottom with openings and having inclined portions,

and upper and lower longitudinal springs extending through the openings of the follower and engaged by the said inclined portions, whereby the springs are forced into engagement with the draw bar when the follower moves inwardly.

26. A draft rigging including a draw bar, a follower provided with upper and lower openings and having inclined portions and connecting bends, and upper and lower springs fixed at their inner ends and extending through the openings of the follower and engaged by the inclined portions thereof, said springs being provided at intermediate points with offsets or bends.

27. A draft rigging including a draw bar, a spring for engaging the draw bar, and a tapered or wedge-shaped member movable with the draw bar and arranged to engage the spring to increase the tension thereof.

28. A draft rigging including a draw bar, a spring engaging the draw bar and having a tapered end, and a tapered or wedge-shaped member movable with the draw bar and engaging the tapered end of the spring for increasing the tension thereof.

29. A draft rigging including a draw bar, upper and lower springs for engaging the draw bar, and transverse friction bars located above and below the draw bar and having tapered or wedge-shaped portions for engaging the springs to increase the tension thereof.

30. A draft rigging including a draw bar, upper and lower springs for engaging the draw bar, a follower provided with means for forcing the springs into engagement with the draw bar when the follower moves inwardly, and upper and lower transverse bars or members provided with means for engaging the springs for increasing the tension of the same.

31. A draft rigging including a draw bar, a spring for engaging the draw bar, a follower having means for forcing the spring inwardly against the draw bar, and a tapered or wedge-shaped member movable with the draw bar for increasing the tension of the spring.

32. A draft rigging including a draw bar, upper and lower springs engaging the draw bar, a cross head extending through the draw bar, upper and lower friction bars arranged to engage the springs to increase the tension thereof, and draw plates connecting the friction bars with the cross head.

33. A draft rigging including a draw bar, upper and lower springs engaging the draw bar, a cross head extending through the draw bar, upper and lower friction bars arranged to engage the springs to increase the tension thereof, draw plates located at opposite sides of the draft rigging and provided with slots receiving the ends of the cross head and the friction bars, and ter-

minimal fastening means for securing the draw plates on the ends of the cross head and friction bars.

34. A draft rigging including a draw bar, a pulling spring, connections between the draw bar and the pulling spring, a rear follower having tapered side portions, and upper and lower tapered members arranged in the path of the follower and forming tapering recesses to receive the side portions thereof.
35. A draft rigging including a draw bar, a pulling spring, connections between the draw bar and the pulling spring, a follower having tapered side portions, and draft beams provided with tapered recesses to receive the tapered portions of the follower and forming stops for the same.
36. A draft rigging including a draw bar, a pulling spring, connections between the draw bar and the pulling spring, a rear follower provided with tapered side portions, rear draft beams provided with upper and lower tapered flanges or enlargements forming tapering recesses to receive the follower, and springs arranged between the flanges or enlargements in position to be engaged by the follower.
37. A draft rigging including a draw bar, a pulling spring, connections between the draw bar and the pulling spring, a rear follower provided with tapered side portions, rear draft beams provided with upper and lower tapered flanges or enlargements forming tapering recesses to receive the follower, and springs having diverging side portions arranged between the flanges or enlargements in position to be engaged by the follower.
38. A draft rigging including a draw bar, a pulling spring, connections between the draw bar and the pulling spring, a rear follower provided with tapered side portions, rear draft beams provided with upper and lower tapered flanges or enlargements forming tapering recesses to receive the follower, and springs arranged between the flanges or enlargements and composed of front triangular loops and rearwardly diverging sides.
39. A draft rigging including a draw bar, a pulling spring, connections between the

draw bar and the pulling spring, a rear follower provided with tapered side portions, rear draft beams provided with upper and lower tapered flanges or enlargements forming tapering recesses to receive the follower, springs arranged between the flanges or enlargements and composed of front loops and rearwardly extending sides, said springs being provided with eyes, a fastening device passing through the eyes and piercing the draft beams, and spacing means carried by the fastening device.

40. A draft rigging including spaced draft beams, a filler block arranged between and rigidly connected with the draft beams, a draw bar, a cushioning spring interposed between the draw bar and the filler block, a follower having spaced sides, and means mounted on the filler block and engaging the sides of the follower for retarding the inward movement of the draw bar.

41. A draft rigging including spaced draft beams, a wooden filler block arranged between the draft beams and provided with a recess, metallic face plates secured to the filler block, a draw bar, cushioning means interposed between the filler block and the draw bar, a follower, and laterally movable friction devices located in the said recess and engaging the follower for retarding the inward or rearward movement of the draw bar.

42. A draft rigging including a bolster, front and rear draft beams, a draw bar, a front buffer spring located in advance of the bolster, a rear pulling spring located in rear of the bolster, connections between the rear pulling spring and the draw bar, and wedge-shaped members located in advance and in rear of the bolster and at opposite sides of the springs for limiting both the inward and outward movement of the draw bar.

In testimony, that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

ADAM WACKMAN.

Witnesses:

WILLIAM DEE BECKER,
ARTHUR MARSHALL.