No. 837,754.

PATENTED DEC. 4, 1906.

J. J. TATUM & A. P. PRENDERGAST.

DRAFT RIGGING FOR CARS.

APPLICATION FILED APR. 26, 1906.

2 SHEETS—SHEET 1.

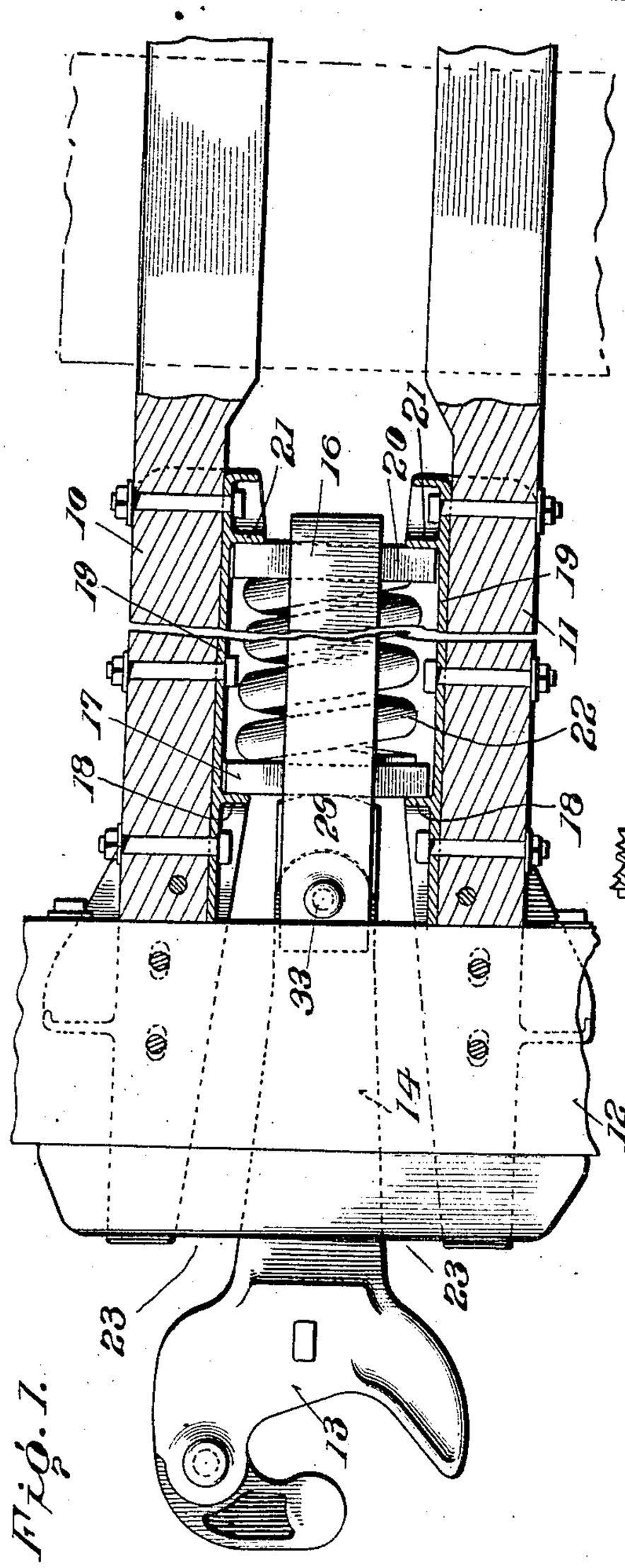

Fig. 1.

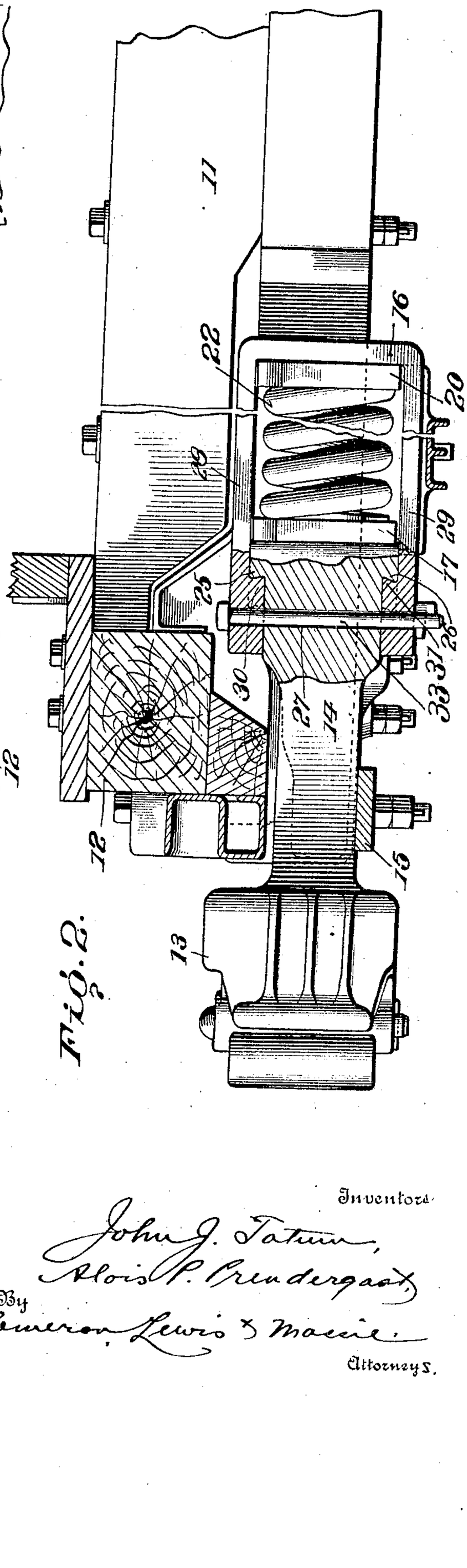

Fig. 2.

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2 SHEETS—SHEET 2.

Fig. 3.

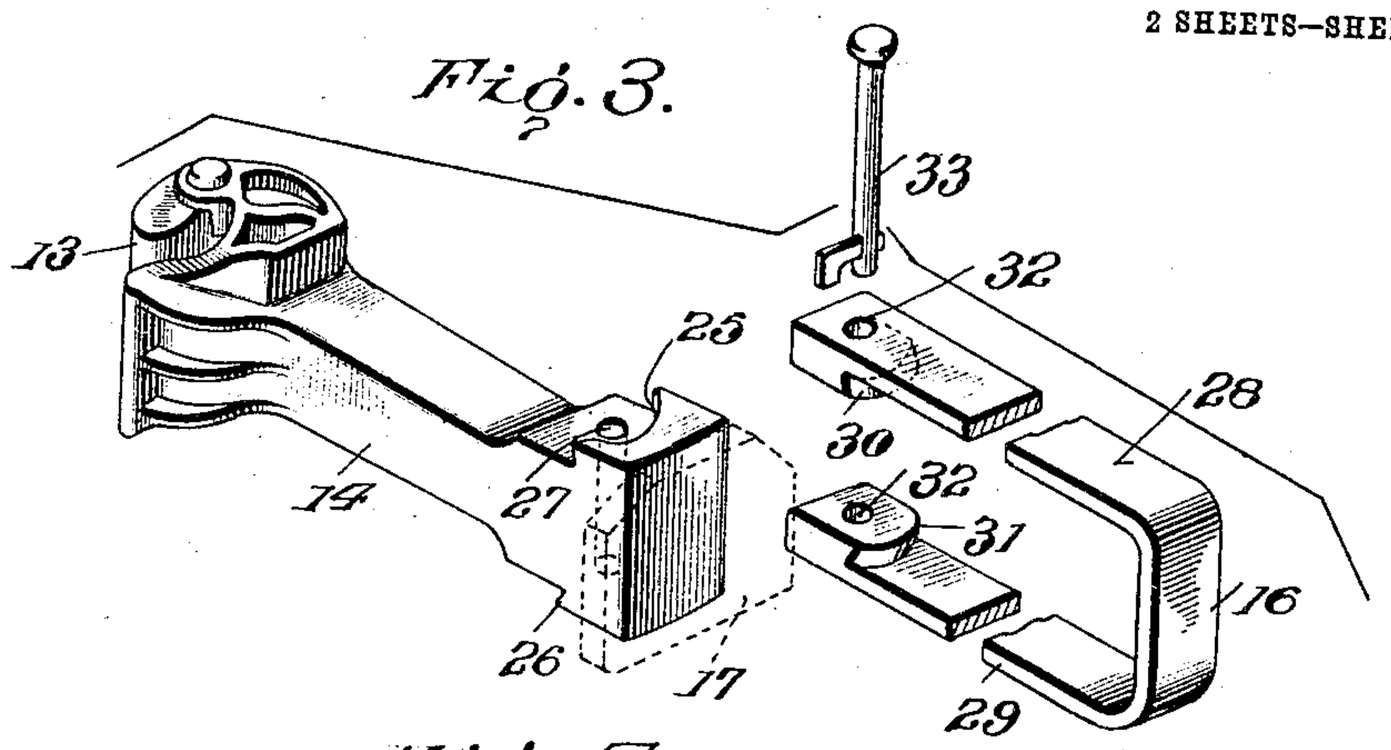


Fig. 4.

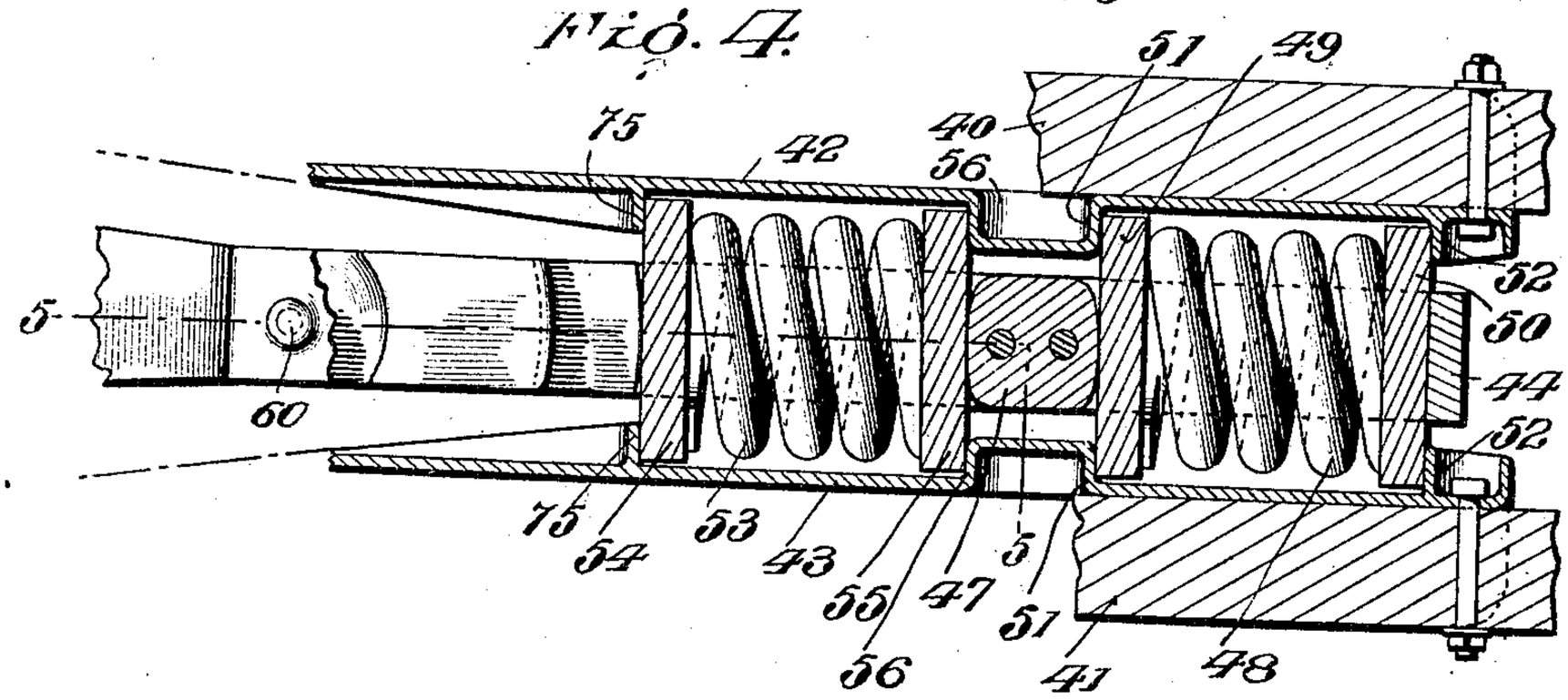


Fig. 5.

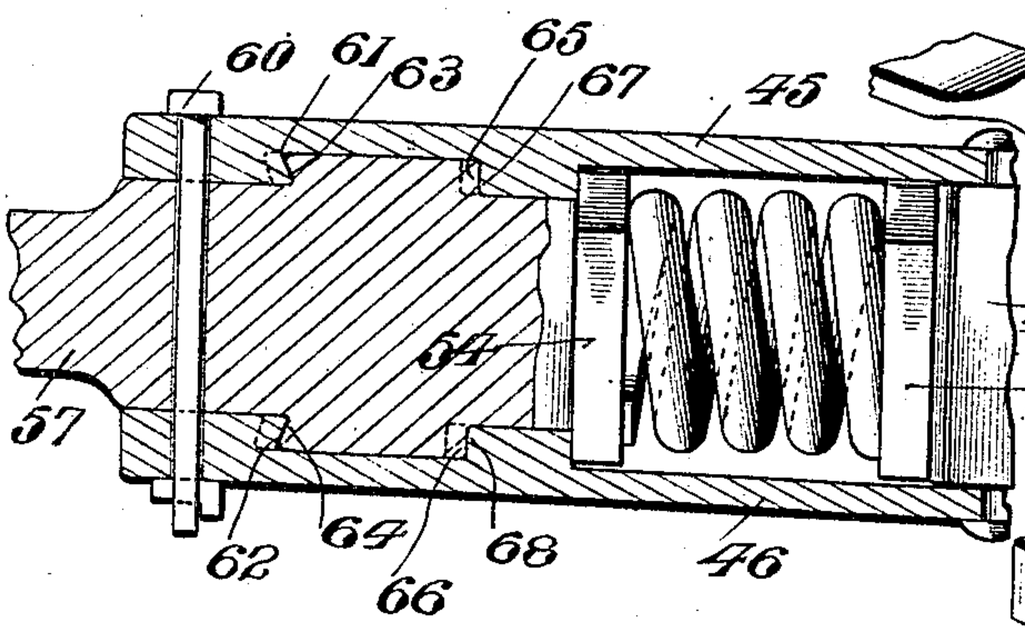
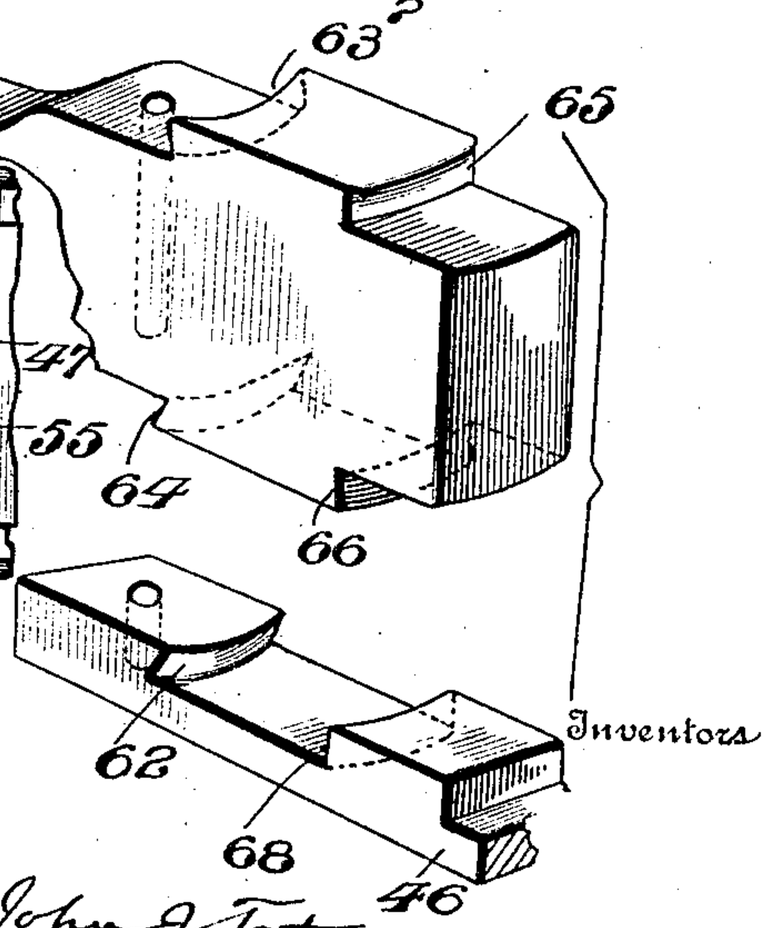


Fig. 6.



Witnesses

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UNITED STATES PATENT OFFICE.

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DRAFT-RIGGING FOR CARS.

No. 837,754. Specification of Letters Patent. Patented Dec. 4, 1906.

Application filed April 26, 1906. Serial No. 313,862.

To all whom it may concern:

Be it known that we, JOHN J. TATUM and ALOIS P. PRENDERGAST, of Baltimore, Maryland, have invented a new and useful Improvement in Draft-Rigging for Cars, which improvement is fully set forth in the following specification.

This invention relates to draft-rigging for railway-cars.

It is the experience of all railroad men that occasional breaking of the connection between the draw-bar and the yoke is unavoidable. Such breakage or injury occurs most frequently in freight-cars, where, by reason of length and weight of trains, the strains upon this connection are more severe than in passenger-trains. When such breakages occur, it is incumbent upon and expected of the train-hands and other employees along the line of the road that they shall quickly make necessary repairs or replace the damaged parts and avoid or minimize delays to the train.

It is the object of the present invention to provide a yoke and draw-bar connection of maximum strength and durability and which may in case of breakage be quickly and expeditiously replaced at any point on the railroad without necessitating the exercise of mechanical skill on the part of train-hands or other employees. The simplicity of the structure eliminates long delays in applying a new yoke to the coupler-stem in place of one damaged or in replacing a damaged or defective coupler. The construction embodies a slip fit over the coupler draw-bar instead of the riveted fastening now in general use, which latter requires shop facilities to make application of a yoke to the draw-bar of a coupler. Owing to the quick and simple method of connecting the yoke to the draw-bar, these improved yokes can be carried on the train for emergency use in case of damage or accident. Furthermore, in our improved design of connection all the pulling and impact stresses are concentrated on the shoulders of radial or curved bosses on the yoke-arms, and hence the liability of breakage is greatly, if not entirely, eliminated from the yoke, the connecting-pin being entirely relieved from pulling and shock stresses.

The improvements constituting our invention may be best explained in connection with the accompanying drawings, illustrating several embodiments thereof, wherein—

Figures 1 and 2 are views in horizontal and transverse section, respectively, showing one embodiment of our invention. Fig. 3 shows in perspective the draw-bar and yoke of Figs. 1 and 2. Fig. 4 is a view, partly in horizontal section, showing another embodiment of the invention. Fig. 5 is a vertical section on line 5 5, Fig. 4. Fig. 6 shows in perspective the end of the draw-bar and the end of one of the yoke-arms, such as illustrated in Figs. 4 and 5.

Referring first to Figs. 1, 2, and 3, 10 and 11 are draft-beams forming part of the framework of a car, and 12 is the transverse sill-beam fastened to beams 10 and 11 at the end of the car.

13 is a coupler-head of ordinary construction at the outer end of draw-bar 14, which latter extends under the car beneath the sill-beam 12 and above a cross-bar 15, upon which said draw-bar rests and moves transversely.

As shown in Fig. 1, there is a clearance 23 (which in actual practice is preferably about two and one-half inches) on each side of the draw-bar when in the position shown in Fig. 1. 16 is the yoke, the arms of which are joined at their free ends to the draw-bar in the manner about to be explained. A follower-plate 17 extends through the end of this yoke contiguous to the end of the draw-bar, said plate in its normal position (shown in Fig. 1) resting against the shoulders 18 18 of draft irons or castings 19 19, said castings being respectively bolted to the draft-beams 10 and 11. A follower-plate 20 extends through the other end of the yoke 16 and at its opposite ends bears against shoulders 21 21 on castings 19 19, respectively. A coiled draft-spring 22 presses at its opposite ends against the follower-plates 17 and 20 and holds said plates against their respective shoulders in the position shown in Fig. 1. When a pulling force is applied to the draw-bar—as, for example, in starting the car—the yoke 16 pulls follower-plate 20 away from its shoulders 21 21, compressing draft-spring 22 against follower-plate 17, thereby gradually starting the car through the yielding connection afforded by the draft-spring.

In stopping the car the inner end of the draw-bar 14 (which is curved for reasons explained hereinafter) bears against follower-plate 17 and carrying the latter away from its shoulders 18 18 compresses spring 22 against follower-plate 20, thus gradually stopping the car through the yielding con-

nection afforded by the draft-spring. It will be noted that in the type of draft-rigging shown in Figs. 1, 2, and 3 all of the pulling or starting power is transmitted through the connection between the yoke 16 and draw-bar 14, whereas in stopping the car no strain whatever falls upon this connection, the end of the draw-bar 14 bearing directly against follower-plate 17, as already explained. Hence in this particular type of draft-rigging the connection between the yoke and draw-bar is required to resist strains only in the direction in which power is applied in starting and pulling the car.

The connection between the yoke 16 and draw-bar 14 constitutes the present invention. At its extremity beneath the car the draw-bar 14 is enlarged, forming on its upper and lower faces concavely-curved shoulders 25 26, respectively, each preferably extending completely across the face of the draw-bar. These shoulders are curved on an arc the center of which is in the axis of an opening 27 through the draw-bar. Said shoulders are preferably slightly undercut, as most clearly shown in Fig. 2. The material forming these shoulders is integral with that forming the draw-bar or firmly welded thereto, so as to form practically an integral structure.

The yoke 16, including its arms 28 and 29, is preferably made of a single piece of wrought-iron bent to the proper form, as shown in the Figs. 1–3. At their extremities the arms 28 and 29 are thickened to form inwardly-projecting convexly-curved shoulders 30 31 on said arms, respectively. Said shoulders are curved on an arc the center of which is in an axis common to openings 32 32 through the thickened ends of the arms, and the shoulders are preferably slightly undercut, as clearly illustrated. The material forming shoulders 30 and 31 is integral with that forming, the arms 28 and 29 or firmly welded thereto so as to form practically an integral structure.

The end of the draw-bar may be engaged between the arms of the yoke by what may be termed a "slip fit"—*i. e.*, the parts should be so proportioned that when the ends of the yoke-arms and the end of the draw-bar are sufficiently overlapped a lateral movement will bring the thicker extremity of the draw-bar between the yoke-arms inside of shoulders 30 and 31 on the latter, whereupon a relative endwise movement of the parts will bring the undercut concavely-curved shoulders 25 26 of the draw-bar into engagement with convexly-curved shoulders 30 and 31, respectively, and the openings 32 32 of the yoke-arms into register with opening 27, permitting the insertion of a pin 33 through said openings. It will thus be apparent that with a minimum number of parts to be handled and carried on a train or placed at outlying stations in case of breakage or other injury to a yoke or coupler while a train is *en route* a new yoke or coupler may be put in place by a simple slip fit. This may be quickly and easily accomplished by one or more train-hands or others, no mechanical skill whatever being required, particularly as no special bending, spreading, or fitting of the yoke is necessary. The shoulders on the yoke and draw-bar are curved on equal radii and undercut on equal angles, affording extended contacting shoulder-surfaces adapted to slide over each other to permit turning of the draw-bar about the axis of openings 27 32 32 when a train passes a curve in the track. This turning of the draw-bar is permitted by the clearances 23 23. Severe and damaging lateral strains experienced in the use of rigid connections between draw-bars and yokes are thus avoided, and there are no pins or rivets which receive any part of the draft strains. The end of the draw-bar bearing against follower-plate 17 is preferably curved on an arc, as shown in dotted lines, Fig. 1, the center of which is in the axis of opening 27. Hence turning of the draw-bar does not move plate 17. The pin 33 is intended merely to connect the parts together, it being the function of the shoulders to receive and resist all the draft strains. The disposition and formation of these shoulders by thickening the ends of the draw-bar and yoke-arms gives them great strength and practically eliminates all liability of weakening by wear. By locating the openings 32 32 beyond the shoulders 30 31 the presence of said openings does not weaken the yoke-arms at points where strains are imposed thereon. The undercutting of shoulders 25, 26, 30, and 31 prevents possible spreading of the yoke-arms 28 and 29 when pulling power is applied through the draw-bar and may entirely relieve pin 33 and its key of any strain in holding these arms the proper distance apart. In fact, the inclination of these shoulders tends to draw the yoke-arms together rather than permit them to spread.

Other advantages of the improved connection will be apparent and need not be here detailed.

In Figs. 4–6 we have illustrated another embodiment of the invention applied to the type of draft-rigging commonly known as a "tandem draft-gear," which is used on both passenger-coaches and freight-cars. It is structurally similar to and possesses substantially the same advantages as the embodiment of the invention already explained. We will particularly explain the points of difference over the structure of Figs. 1–3. 40 41 are the draft-beams, to which draft-irons 42 and 43 are secured, respectively. 44 is the yoke having arms 45 and 46, between which bridge-piece 47 is bolted. A spring 48 between

follower-plates 49 and 50 normally presses the plate 49 against shoulders 51 51 of the draft-irons and plate 50 against shoulders 52 52 of said irons. Likewise a spring 53 between follower-plates 54 and 55 normally presses plate 54 against shoulders 75 75 of the draft-irons and plate 55 against shoulders 56 56 of said irons. The draw-bar 57, connected to the yoke between the ends of the arms thereof in a manner presently to be explained, is preferably curved at its extremity where it contacts with follower-plate 54 for reasons explained in connection with Figs. 1–3. When force is applied to the draw-bar in starting the car, the closed end of the yoke bearing against follower-plate 50 advances the latter, compressing spring 48 against follower-plate 49, which remains seated against shoulders 51 51, and hence cannot move. At the same time bridge-piece 47 carries forward the follower-plate 55, compressing spring 53 against follower-plate 54, which latter remains seated against its shoulders 75 75. In thus starting the car through the yielding connection afforded by the springs the entire pulling force is transmitted through the connection between the yoke and draw-bar. In stopping the car the inner end of the draw-bar bearing directly against follower-plate 54 moves the latter to compress the spring 53 against follower-plate 55, and likewise bridge-piece 47 moves follower-plate 49 to compress spring 48 against follower-plate 50. It will therefore be seen that only one-half of the power exerted in stopping the car is applied through the connection between the draw-bar and yoke, though this is a point of no special significance to the embodiment of the invention now being explained.

The connection between the draw-bar and yoke includes convexly-curved undercut shoulders 61 62 on the yoke-arms engaging concavely-curved undercut shoulders 63 64 on the draw-bar, a pin 60 passing through the draw-bar and yoke in the axis of said shoulders, all of the parts being arranged and operating in substantially the same manner as the corresponding parts in Figs. 1–3. On its upper and lower faces between the shoulders 63 64 and its inner end the draw-bar is provided with convexly-curved shoulders 65 66, facing in a direction opposite that in which shoulders 63 64 face. The arcs of curvature of shoulders 65 66 are concentric to those of shoulders 63 and 64, respectively, the relative positioning of these four shoulders forming two wide curved ribs extending across the upper and lower faces, respectively, of the end of the draw-bar. Yoke-arm 45 has on its inner face a concavely-curved shoulder 67, corresponding to the shape of and coöperating with shoulder 65 on the draw-bar. Yoke-arm 46 has a similar shoulder 68, coöperating with shoulder 66 of the draw-bar. The relative positioning of the shoulders on the yoke-arms forms across the inner faces of said arms at their thickened ends curved grooves, in which the approximately counterpart ribs on the draw-bar may be readily engaged by a slip fit and will freely move when the draw-bar turns on the arc-shaped shoulders as the train passes a curve in the track. In starting or pulling the car the strain is sustained by shoulders 63 and 64 bearing against shoulders 61 and 62. In stopping, the shoulders 65, 66, 67, and 68 sustain practically only that portion of the strain which presses bridge-piece 47 against follower-plate 49 and, through the latter and the spring 48, resisting forward movement of the car, the remainder of the strain being substantially all taken up by the draw-bar 57 acting against plate 54. Shoulders 65, 66, 67, and 68 may also be suitably undercut, if desired.

While we have herein shown and described the preferred embodiments of the invention, it is manifestily susceptible of other mechanical expressions.

What is claimed is—

1. In a draft-rigging for cars, the combination with a yoke having a curved groove across the inner face of each of its arms near the end thereof forming on each arm two oppositely-facing curved shoulders, of a draw-bar engaging between the ends of the yoke-arms and having across opposite faces thereof curved ribs engaging the grooves in the yoke-arms respectively, each of said ribs forming two oppositely-disposed curved shoulders adapted to coöperate with the curved shoulders formed by the groove of the corresponding yoke-arm, the common axis of said curved shoulders passing through the ends of the yoke-arms.

2. In a draft-rigging for cars, the combination with a yoke having a curved groove across the inner face of each of its arms near the end thereof forming on each arm two oppositely-facing curved shoulders, of a draw-bar engaging between the ends of the yoke-arms and having across opposite faces thereof curved ribs engaging the grooves in the yoke-arms respectively, each of said ribs forming two oppositely-disposed curved shoulders adapted to coöperate with the curved shoulders formed by the groove of the corresponding yoke-arm, said coöperating shoulders being curved on substantially equal radii of a common axis which passes through the ends of the yoke-arms.

3. In a draft-rigging for cars, the combination with a yoke having a curved groove across the inner face of each of its arms near the end thereof forming on each arm two oppositely-facing curved shoulders, of a draw-bar engaging between the ends of the yoke-arms and having across opposite faces thereof curved ribs engaging the grooves in the

yoke-arms respectively, each of said ribs forming two oppositely-disposed curved shoulders adapted to coöperate with the curved shoulders formed by the grooves of the corresponding yoke-arms, said coöperating shoulders being curved on substantially equal radii of a common axis which passes through the ends of the yoke-arms, and a pin passing through the yoke-arms and draw-bar in the line of said common axis.

4. In a draft-rigging for cars, the combination with a metal yoke having an inwardly-projecting shoulder on each of its arms near the end thereof, said shoulders being secured throughout their length to said yoke, of a draw-bar engaging at its rear end between the ends of the yoke-arms and having on opposite faces outwardly-projecting shoulders engaging the inwardly-projecting shoulders on the yoke-arms respectively, the shoulders on one part being convexly curved and those on the other part being concavely curved, the axis of said curves passing through the thickened ends of the arms, the yoke and draw-bar being adapted to be brought into proper operative relation without increasing the normal operative distance between the yoke-arms.

5. In a draft-rigging for cars, the combination with a metal yoke having an inwardly-projecting undercut shoulder on each of its arms near the end thereof, said shoulders being secured throughout their length to said yoke, of a draw-bar engaging at its rear end between the ends of the yoke-arms and having on opposite faces outwardly-projecting undercut shoulders engaging the inwardly-projecting shoulders on the yoke-arms respectively, the shoulders on one part being convexly curved and those on the other part being concavely curved, the axis of said curves passing through the thickened ends of the arms, a pin passing through the yoke-arms and draw-bar in line of said common axis, the yoke and draw-bar being adapted to be brought into proper operative relation without increasing the normal operative distance between the yoke-arms.

6. In a draft-rigging for cars, the combination of a draw-bar and a yoke whose arms embrace the end of the draw-bar, said draw-bar and the arms of said yoke having engaging arc-shaped integral draft-shoulders which alone receive all draft strains between the draw-bar and yoke, and a pin passing vertically through said yoke-arms and draw-bar in the axis of said shoulders and free from draft strains.

7. In a draft-rigging for cars, the combination of a draw-bar having integral arc-shaped draft-shoulders formed thereon, with a yoke each of whose arms has a corresponding arc-shaped draft-shoulder thereon in engagement with one of the said shoulders on the draw-bar, the shoulders on the draw-bar and yoke-arms receiving all the draft strains between the said bar and yoke, and a vertical pin in the common axis of said shoulders and free from draft strains.

8. In a draft-rigging for cars, the combination of a draw-bar having on each of its upper and lower faces a pair of arc-shaped oppositely-facing shoulders, with a yoke each of whose arms has on its inner face oppositely-facing arc-shaped shoulders in engagement with the corresponding shoulders on the draw-bar, the shoulders on the draw-bar and the yoke-arms receiving all the draft and buffer strains between the said bar and yoke, and a vertical pin in the common axis of all of said shoulders, which pin is free from all draft and buffer strains.

9. In a draft-rigging for cars, the combination of a draw-bar having on its upper and lower faces arc-shaped draft-shoulders, with a yoke each of whose arms has a corresponding arc-shaped draft-shoulder thereon in engagement with one of said shoulders on the draw-bar, the shoulders on the draw-bar and yoke-arms receiving all the draft strains between the said bar and yoke, and all of said shoulders having a common axis located at a point between the shoulders on the yoke-arms and the ends of said arms, and a vertical pin in the common axis of said shoulders and free from draft strains.

10. In a draft-rigging for cars, the combination of a draw-bar having on each of its upper and lower faces a draft-shoulder and a buffing-shoulder and a yoke whose arms embrace the end of the draw-bar, each of said arms having on its interior face oppositely-facing draft and buffing shoulders, all of said shoulders on the draw-bar and the yoke having a common axis, and the draft-shoulders on the draw-bar and yoke respectively receiving all the draft strains and the buffer-shoulders on said parts receiving all the buffing strains between the draw-bar and yoke, and a pin passing vertically through said yoke-arms and draw-bar in the axis of all of said shoulders and free from draft and buffing strains.

In testimony whereof we have signed this specification in the presence of two subscribing witnesses.

JOHN J. TATUM.
ALOIS P. PRENDERGAST.

Witnesses:
D. ARDIN CARRICK,
GEO. W. CARRICK.