F. S. ARTER.

DRAFT RIGGING.

APPLICATION FILED DEC. 21, 1914.

1,184,708.

Patented May 30, 1916.

2 SHEETS—SHEET 1.

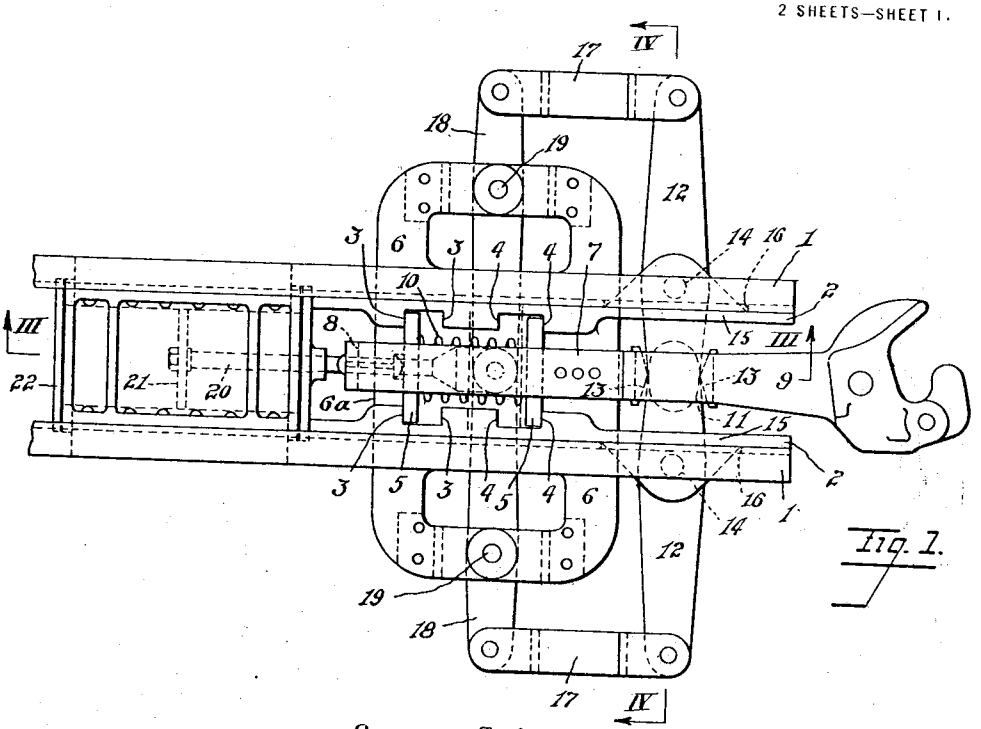


Fig. 1.

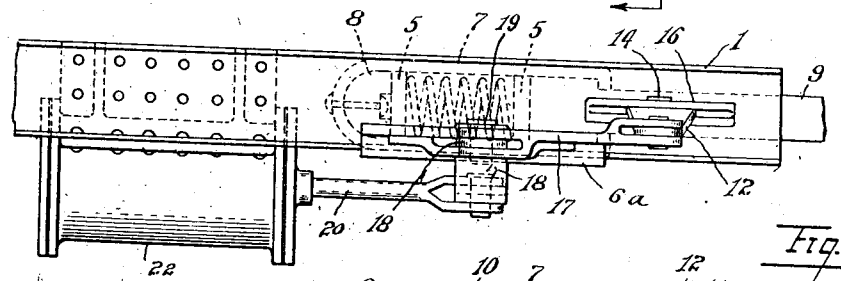


Fig. 2.

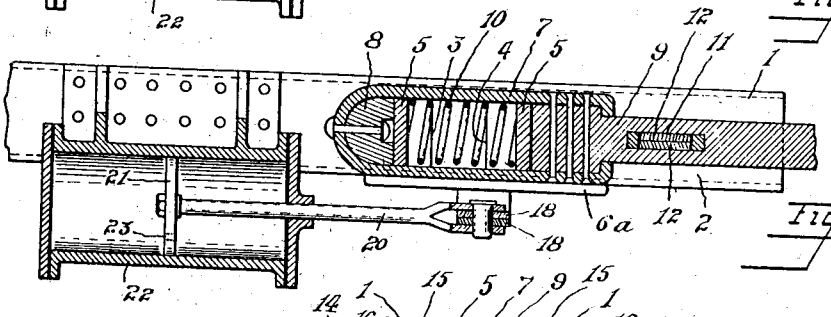


Fig. 3.

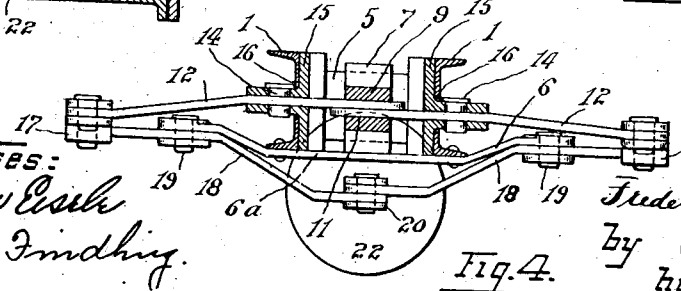


Fig. 4.

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2 SHEETS—SHEET 2.

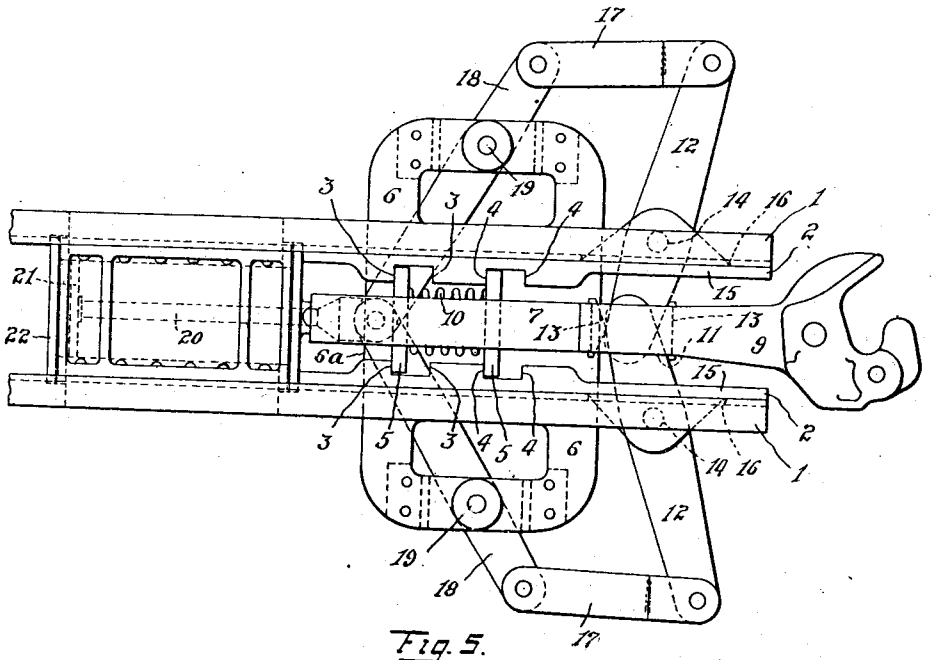


Fig. 5.

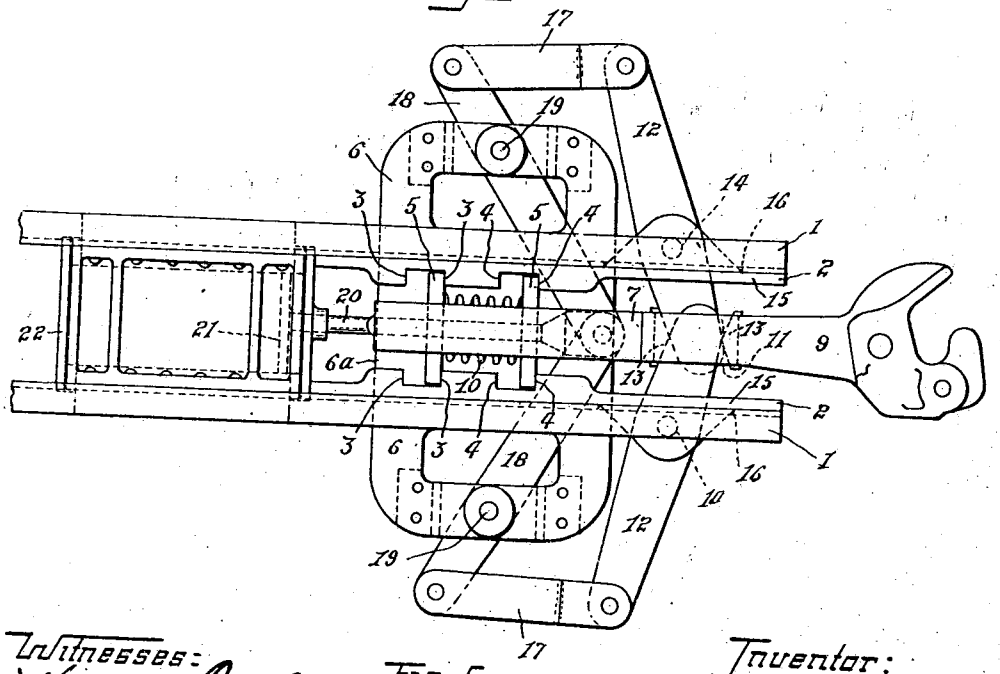


Fig. 6.

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UNITED STATES PATENT OFFICE.

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DRAFT-RIGGING.

1,184,708. Specification of Letters Patent. Patented May 30, 1916.

Application filed December 21, 1914. Serial No. 878,317.

To all whom it may concern:

Be it known that I, FREDERICK S. ARTER, a citizen of the United States, resident of Cleveland, county of Cuyahoga, and State of Ohio, have invented a new and useful Improvement in Draft-Rigging, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

My invention relates to draft-rigging for railway or similar cars, its object being to provide a draft-rigging which will be economical of construction and efficient in its operation.

The said invention consists of means hereinafter fully described and particularly set forth in the claims.

The annexed drawings and the following description set forth in detail certain means embodying my invention, the disclosed means, however, constituting but one of various mechanical forms in which the principle of the invention may be applied.

In said annexed drawings:—Figure 1 represents a plan of a draft-rigging embodying my invention and showing the end portion of the longitudinal sills of a car in connection therewith, the parts of the rigging being shown in their normal position. Fig. 2 represents a side elevation of the mechanism and parts shown in Fig. 1. Fig. 3 represents a longitudinal vertical section taken upon the plane indicated by line III—III in Fig. 1. Fig. 4 represents a transverse section taken upon the plane indicated by line IV—IV in Fig. 1, part of the elements, however, cut by the plane of section being shown in elevation. Fig. 5 represents a view similar to Fig. 1 showing the parts in the position in which the draw-bar is pushed inwardly. Fig. 6 is a view similar to that of Fig. 1 showing the parts in the position in which the draw-bar is pulled outwardly.

In the illustrated embodiment of my invention, the main longitudinal center sills 1 are utilized to form the main support for the draft-rigging, as is customary.

Each of the end portions of the opposing vertical faces of the sills is provided with a draft plate 2, as is also customary. This draft plate is provided with two sets of opposing abutments 3, 3, and 4, 4, as clearly shown in Fig. 1 and seated between each of these pairs of abutments is a follower plate 5. Secured to the under side of the sills and extending laterally from the outer faces of same is a frame 6, the central portion 6^a of which has its upper face flush with the bottom faces of the sills, as shown in Fig. 3. Upon this central portion rests the strap 7 of the draw-bar. In the rear end of this strap is secured a follower block 8 and to the front end of said strap is secured the rear end of the main element or casting 9 of the draw-bar. The follower plates 5 are located upon the inside of such strap, as shown in Fig. 3, and a coil spring 10 is located between the opposing faces of these follower plates and tend to push the latter apart and cause their outer faces to respectively engage the outermost and rearmost abutments 3 and 4, as shown in Fig. 1.

The draw-bar casting 9 is formed with a horizontal slot 11 into which projects the ends of two horizontally extending levers 12, 12; these ends being superimposed, as shown in Fig. 4. The ends of this slot are provided with friction or wearing plates 13, 13, which receive the direct contact of these lever ends, as shown in Fig. 1. These levers are pivoted at 14 to castings 15 which are secured to the inner opposing faces of the sills 1 and extend through slots 16 formed in the latter. The outer ends of these levers are pivotally connected with one end of links 17, 17, the other ends of which are pivotally connected with horizontally extending levers 18, 18, pivoted at 19 to the lateral extensions of the frame 6. The other ends of these levers 18 are pivotally connected with the front end of a piston rod 20, as shown in Fig. 3. This piston rod is connected with a piston 21 which operates in a cylinder 22 which is secured to the sills 1, as shown in Fig. 3. This cylinder may be filled with any suitable fluid, air being, however, preferably used.

The pivotal axes of the levers 12 and 18 are so arranged that a given movement of the draw-bar will effect a movement of greater amplitude on the part of the piston rod and piston. In the device illustrated, this arrangement is such that a given movement of the draw-bar will result in four times such movement on the part of the piston and piston rod. The piston is preferably provided with a small opening 23 through which the fluid may pass from one side to the other thereof.

The above described device operates as follows:—Assuming now that neither a pulling or pushing force is being applied to the draw-bar, if the parts do not occupy their normal positions, as illustrated in Fig. 1, the spring 10 will exert force against one or the other of the follower plates and move the draw-bar and connected parts into such normal position. In this position the two follower plates abut those members of the pair of abutments which are farthest removed. The location of the cylinder 22 is such that in this normal position of parts, the piston occupies a central position in such cylinder, as shown in Fig. 3. Let it be assumed now that a pushing force is applied to the draw-bar as is the case when another car is backed into the car carrying the above-described device, for the purpose of coupling them together. When this force is so applied, the draw-bar is pushed inwardly, which movement is accompanied by the actuation of the levers 12, 12, and through the previously described intermediate connections, the actuation inwardly of the piston rod 20 and attached piston 21. The fluid in the inner end of the cylinder is thus compressed and acts as a buffer absorbing the initial shock. During such movement of the draw-bar, the outermost follower plate 5 is carried rearwardly, imparts its movement to the spring 10 which in turn imparts its movement to the innermost follower plate 5. A continued application of this force causes the outermost follower plate to engage the innermost abutment 4 and thus impart the movement to the draft plates 2, the sills 1, and thus to the car itself, the innermost follower plate being pushed by the spring against the innermost abutment 3. Before this engagement between the follower plate and draft plates occurs, however, the shock of the first impact will be taken up by the fluid in the cylinder. Air as a fluid for absorbing this initial shock is thus rendered especially efficient by reason of the employment of the previously described structure by means of which the movement of the draw-bar effects a greatly increased amount of movement on the part of the piston, as will be readily understood by those skilled in the art. The position of the parts as last described is shown in Fig. 5, the piston in this case occupying its extreme innermost position. Assuming now that the pushing force is removed and the draw-bar thus relieved, the spring, its innermost end abutting the innermost of the two follower plates which in turn abuts the innermost of the abutments 3, will exert a force outwardly against the outermost follower plate, which force will tend to move the parts back into their normal positions. This action of the spring will be assisted by the compressed fluid or air operating against the innermost side of the piston and in fact this air pressure will itself be sufficient in some cases to effect this movement where the piston and cylinder are absolutely air-tight as well as the engaging surfaces of the piston-head and piston-rod. The spring, however, is provided to assure the assumption of the parts of their normal position, should the piston not be absolutely air-tight, and in case a continued force applied to the draw-bar were to hold such piston in its innermost position, the air would leak from the high pressure side to the low pressure side and a state of equilibrium be produced which would prevent the return of the parts to their normal position without the aid of the spring.

A pulling force applied to the draw-bar will effect the same operation above described with the exception that the parts will assume the position shown in Fig. 6, in which the piston occupies the outermost end of the cylinder, and motion is applied to the car through the engagement of the innermost follower plate with the outermost abutments 3, as shown.

Instead of resorting to the niceties of construction which would render the piston and cylinder absolutely air-tight, I prefer to provide a definite leakage between the opposite sides of the cylinder through the piston, and for this purpose the aperture or opening 23 is provided. When such aperture is employed, the operation of the spring 10 is facilitated, as will be understood.

In this manner I am enabled to provide a simple and highly efficient draft-rigging in which the usual car construction is not altered and in which the usual type of draw-bar and draft-plates may be employed.

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

1. In a draft-rigging, the combination of a draw-bar; a fluid-controlled shock-absorber; a system of levers extending laterally on each side of said draw-bar and connecting the latter with said shock-absorber; and means tending to maintain the parts of said shock-absorber and draw-bar in a normal position.

2. In a draft-rigging, the combination of a draw-bar; a fluid-controlled shock-absorber; two duplicate systems of levers extending respectively from opposite sides of and connected with said draw-bar, said lever systems each connecting said shock-absorber with said draw-bar; and means tending to maintain the parts of said shock-absorber in a normal position.

3. In a draft rigging, the combination of a draw-bar; a fluid-controlled shock-absorber; a system of levers extending laterally of said draw-bar and connecting the latter with said shock-absorber; and means

tending to maintain the parts of said shock-absorber and draw-bar in a normal position; said draw-bar being provided with an aperture, and one element of said lever system being arranged so as to project into said aperture and loosely engage said draw-bar.

4. In a draft rigging, the combination of a draw-bar; two sill between which said draw-bar is mounted; a fluid-controlled shock-absorber mounted upon said sills; a system of levers extending laterally on each side of said draw-bar and connecting the latter with said shock-absorber; said draw-bar being provided with an aperture, and said lever system including two elements having their ends projecting into said aperture and loosely engaging said draw-bar; and means tending to maintain the parts of said shock-absorber and draw-bar in a normal position.

5. In a draft rigging, the combination of a draw-bar; a pair of longitudinal sills between which said draw-bar is mounted; a pair of frames secured to the bottom and extending laterally of said sills; a fluid-controlled shock-absorber mounted upon the latter and projecting downwardly therefrom; two duplicate systems of levers extending respectively from opposite sides of and connected with said draw-bar; and means tending to maintain the parts of said shock-absorber and draw-bar in a normal position; each of said lever systems comprising a lever mounted upon one of said frames, having one end connected with said shock-absorber, a lever mounted upon one of said sills and having one end engaging said draw-bar and a link connecting the other ends of said levers with each other.

Signed by me, this 17th day of December, 1914.

FREDERICK SHAW ARTER.

Attested by—

WM. R. MILLER,

D. M. FINDLING.