

B. P. STRAW.
DRAFT RIGGING.
APPLICATION FILED AUG. 28, 1919.

1,376,480.

Patented May 3, 1921.
3 SHEETS—SHEET 1.

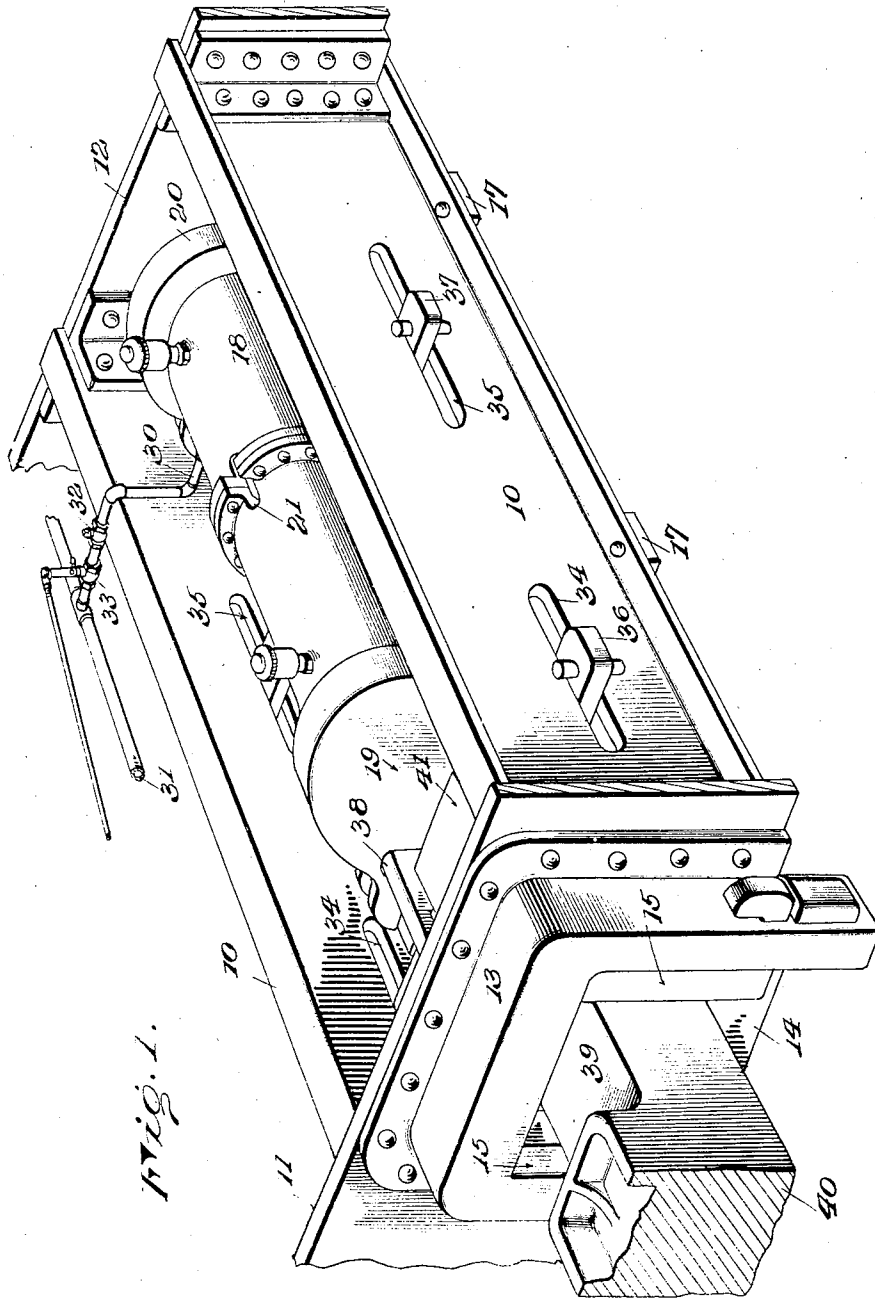


Fig. 1.

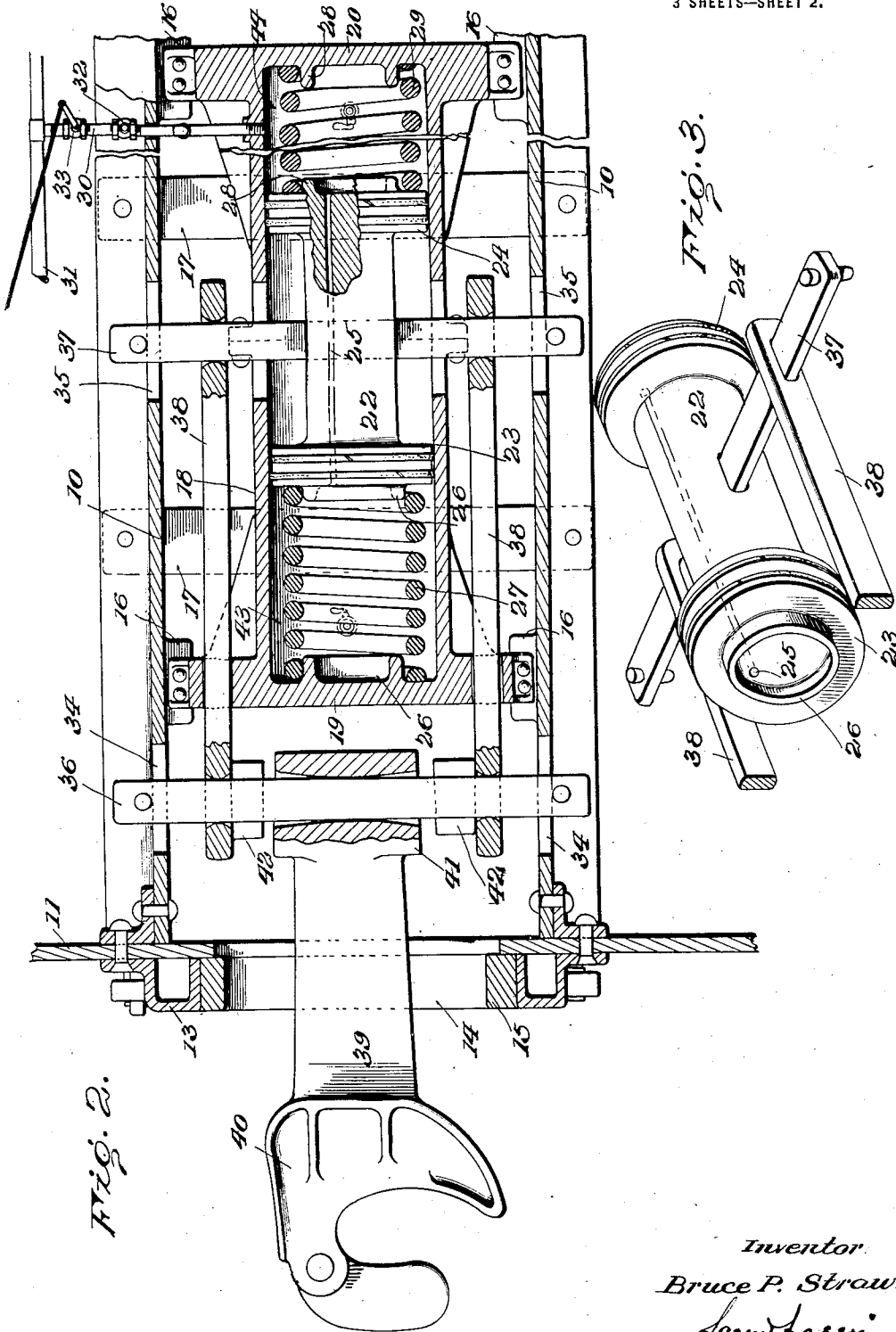
Inventor.
Bruce P. Straw
by *Harry Lacey*
his Att'y

B. P. STRAW.
DRAFT RIGGING.
APPLICATION FILED AUG. 28, 1919.

1,376,480.

Patented May 3, 1921.

3 SHEETS—SHEET 2.



Inventor
Bruce P. Straw
by *Lawrence*
his Atty's.

B. P. STRAW.
DRAFT RIGGING.
APPLICATION FILED AUG. 28, 1919.

1,376,480.

Patented May 3, 1921.

3 SHEETS—SHEET 3.

Fig. 4.

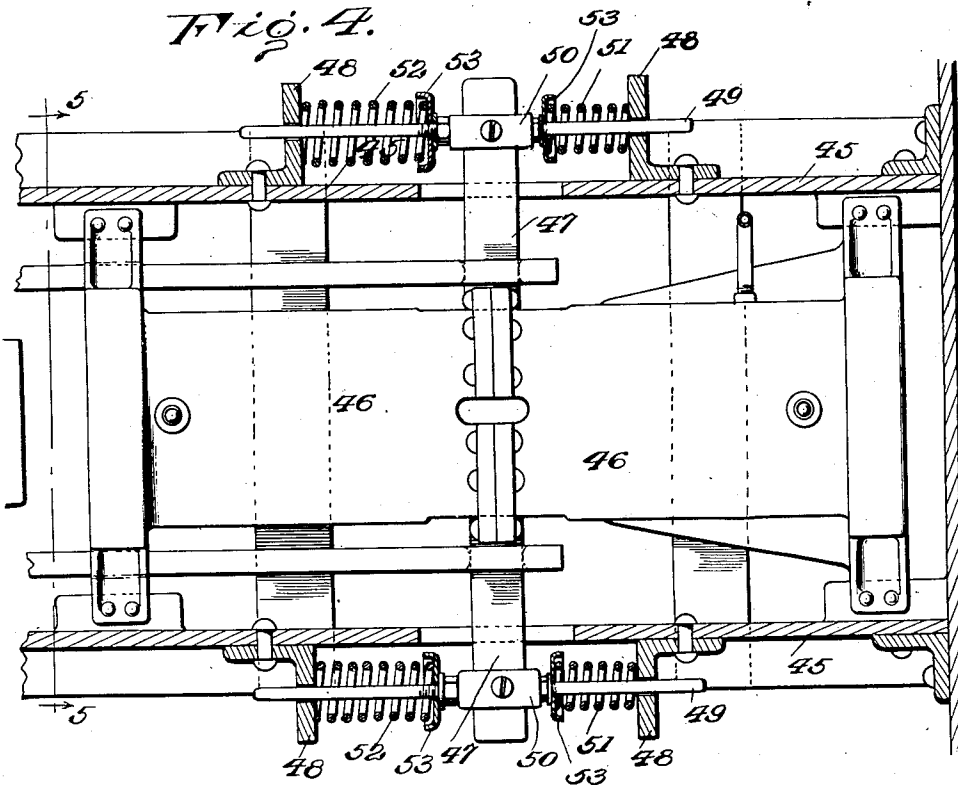
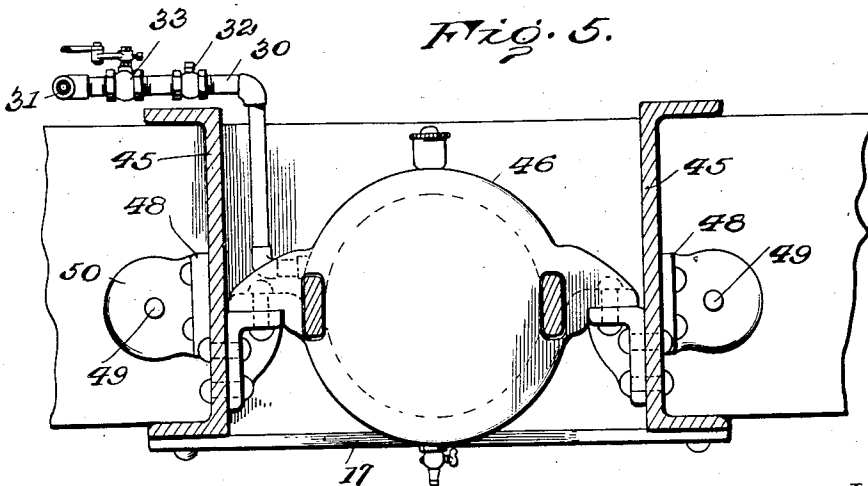


Fig. 5.



Inventor.
Bruce P. Straw.

by *Kearney & Kearney*
his Attys.

UNITED STATES PATENT OFFICE.

BRUCE P. STRAW, OF CUMBERLAND, MARYLAND.

DRAFT-RIGGING.

1,376,480.

Specification of Letters Patent.

Patented May 3, 1921.

Application filed August 28, 1919. Serial No. 320,367.

To all whom it may concern:

Be it known that I, BRUCE P. STRAW, a citizen of the United States, residing at Cumberland, in the county of Allegany and State of Maryland, have invented certain new and useful Improvements in Draft-Rigging, of which the following is a specification.

This invention relates to a draft rigging for railway cars and has as one of its principal objects to provide a construction wherein the draw bar will be spring cushioned in its longitudinal movement.

The invention has as a further object to provide a construction wherein the draw bar will also be air cushioned in its longitudinal movement.

A further object of the invention and one equally important with the objects foregoing, is to provide a construction wherein the draw bar will be air cushioned in such manner that at no time will any free longitudinal play of the bar be permitted.

The invention has a further object in this connection to provide a construction wherein rebound of the draw bar will be prevented when the draw bar is suddenly relieved of either forward or rear thrust.

And the invention has as a still further object to provide a construction wherein longitudinal movement of the draw bar in either direction will serve to proportionately build up or increase the volume of a cushion of air for resisting or arresting sudden movement of the draw bar in the opposite direction.

Other and incidental objects will appear hereinafter. In the drawings:

Figure 1 is a fragmentary perspective view of my improved draft rigging,

Fig. 2 is a central horizontal sectional view taken through the rigging, parts, however, being shown in elevation,

Fig. 3 is a fragmentary perspective view showing the piston of the cushioning cylinder and associated parts in detail,

Fig. 4 is a fragmentary plan view showing a slight modification of the invention, parts being broken away and illustrated in section, and

Fig. 5 is a transverse sectional view taken on the line 5-5 of Fig. 4 and looking in the direction of the arrows.

In carrying the invention into effect, I employ channeled draft sills 10 connected

at their forward ends by a front sill or plate 11 and at their rear ends by a similar sill or plate 12. Secured to the front sill is a striking plate 13 upon which is mounted a horizontal carry bar 14 as well as a vertical filler block 15. All of this structure is in accordance with usual practice and may be of any approved design. Projecting inwardly from the sills 10 adjacent their forward and rear ends are pairs of lugs 16 and extending between the sills are spaced cradle plates 17 supporting an air cushioning cylinder 18. As particularly shown in Fig. 1, the cylinder is formed of mating aligned sections suitably secured together and formed on the cylinder at its ends are heads 19 and 20 respectively, provided with lateral hangers connected to the lugs 16 for holding the cylinder against longitudinal movement. Upstanding from the cylinder adjacent its ends are suitable oil cups while approved drain cocks depend from the end portions of the cylinder at its lower side. At a point substantially midway of its ends, the cylinder is further provided at its upper side with an oil slot 21. Mounted to reciprocate within the cylinder is a double ended piston 22 provided at one end with a head 23 and at its opposite end with a similar head 24. These heads fit snugly within the cylinder and are provided with suitable piston rings for insuring constantly sealed joints between the piston heads and the wall of the cylinder. Formed longitudinally through the piston is a by-pass or channel 25 opening at its ends through the piston heads. The purpose of this channel will later appear. The head 19 of the cylinder, as well as the piston head 23, is provided with an annular centering flange 26 and engaged at its ends around these flanges is a cushioning spring 27. Formed on the head 20 of the cylinder and the piston head 24 are similar centering flanges 28 and engaged at its ends around these flanges is a cushioning spring 29 similar to the spring 27 and of equal length. Entering the cylinder adjacent its rear end is a branch pipe 30 from a main train line pipe 31 in communication with a suitable source of compressed air supply. The branch pipe 30 is fitted through the adjacent draft sill and interposed in said pipe is an approved check valve 32 as well as a cut-off valve 33. Any approved means may be provided for operating the latter valve.

Formed through the sills 10 adjacent their forward ends are oppositely disposed longitudinal slots 34 and formed through the rear end portions of the sills are similar oppositely disposed slots 35. Extending through the pair of slots 34 and slidable longitudinally thereof is a cross bar 36 equipped at its ends with stop pins or other approved means holding the bar against displacement from the sills. A similar cross bar 37 extends through the pair of slots 35 for sliding movement longitudinally of said slots and, like the bar 36, is equipped at its ends with stop pins or other approved means for preventing longitudinal movement of the bar. As particularly shown in Fig. 3, this bar 37 snugly extends through a suitable opening formed in the piston 22 intermediate of the ends thereof so that the piston is thus connected to the bar to move therewith. Coupling the cross bars 36 and 37 to move in unison are tie rods 38. As best illustrated in Fig. 2, these rods are arranged at opposite sides of the cylinder 18 and encircle the cross bars while the tie rods themselves are slidably fitted through the lateral hangers on the head 19 of the cylinder and are thus held against lateral movement with respect to each other. Connected to the front cross bar 36 is a draw bar 39 provided at its outer end with a standard coupler head 40. The shank of this bar extends freely through the striking plate 13 as well as the front sill 11, the shank normally resting upon the carry bar 14, and is provided at its inner end with a sleeve 41 loosely encircling the cross bar 36. Fitted upon the cross bar between the ends of said sleeve and the forward ends of the tie rods 38 are spacers 42.

As will now be readily understood in view of the preceding description, the piston 22 will provide a follower common to both of the springs 27 and 29. Pull upon the draw bar will result in a compression of the spring 27 so that this spring will, while allowing the bar to move longitudinally forward, thus cushion the bar. Likewise, impact upon the draw bar will result in a compression of the spring 29. The draw bar will thus be similarly cushioned in its rearward longitudinal movement. The springs 27 and 29 will, therefore, provide a primary means for cushioning the draw bar in its movement in opposite directions. The piston 22 defines a compression chamber 43 at the forward end of the cushioning cylinder 18 and a similar compression chamber 44 at the rear end of the cylinder, and normally the valve 33 will be open so that both of these chambers will be filled with air at a pressure equal to the pressure of air within the main train line pipe 31. In this connection it will, of course, be understood that air entering the chamber 44 will flow through the bypass 25 into the chamber 43

and, owing to the presence of the check valve 32 in the branch pipe 30, air in the compression chambers will be prevented from escaping therefrom. The bypass 25 is of a size to permit only a limited flow of air therethrough. Therefore, when the piston 22 is moved forwardly, as just described, against the tension of the spring 27, air in the chamber 43 will be partially trapped therein so that the piston head 23 will thus act against the air in said chamber for cushioning, in conjunction with said spring, the forward movement of the draw bar. Obviously, forward movement of the piston tends to compress air in the chamber 43 and there is a retarding checking reaction on the piston. However, the unusual pressure to which the air in said chamber will thus be subjected will result in an accelerated flow of air from this chamber to the chamber 44 until the air pressure in said chambers is balanced. Therefore, when the forward pull upon the draw bar is relieved or in the event that this pull should be suddenly relieved, the piston head 24 will act against the air in the chamber 44 to check rebound of the piston and of the draw bar. In draft rigging of the type employing one or more springs alone for cushioning the draw bar against pull and impact thereon, as heretofore constructed, said rigging is subject to the seriously objectionable feature that when said spring or springs are compressed under forward or rear movement of the draw bar, as the case may be, such springs will suddenly expand when the pull or impact upon the draw bar is relieved to accordingly result in a sudden rebound of the draw bar. In draft rigging of the tandem type as heretofore constructed, it often occurs that the forward spring or springs are compressed in such degree that the follower employed moves out of contact with the rear spring or springs or vice versa. Consequently, when the stress upon the draw bar is relieved and the draw bar rebounds, the followers strike the springs a sharp forceful blow producing a severe strain upon the mechanism. The present construction overcomes these disadvantages, forward movement of the piston 22 causing, as just described, a flow of air through the bypass 25 from the chamber 43 into the chamber 44, to proportionately augment the volume of air in the latter chamber. Consequently, when the pull upon the draw bar is relieved, this increased volume of air, aside from being already under the main train line pressure, will, owing to the restricted nature of the bypass, be partially trapped in said chamber for effectually resisting any rebound of the draw bar. Results similar to those just described will also be had under the influence of impact against the draw

bar. Upon rearward movement of the piston, the piston head 24 will act against the air within the chamber 44 and this operates in conjunction with the spring 29 for cushioning the impact. As the piston moves rearwardly, the volume of air in the chamber 43 will be increased so that when the thrust upon the draw bar is relieved the piston head 23 will act against the air in said chamber for effectually overcoming forward rebound of the draw bar. It will, therefore, be seen that I provide an arrangement wherein the piston and air cylinder provide not only a secondary means for cushioning any pull or impact upon the draw bar but also provide a means whereby rebound of the draw bar will be overcome while at no time will any free forward or rear play of the bar be permitted.

In Figs. 4 and 5 of the drawings, I have shown a slight modification of the invention which is more particularly designed for use upon freight cars. In this modification the draft sills are indicated at 45, the cushioning cylinder at 46, and the cross bar extending through said cylinder at 47, all of these parts corresponding to similar parts of the previously described construction. Secured to the draft sills at the outer sides thereof are brackets 48 spaced from the cross bar, and slidable through said brackets are thrust rods 49 provided intermediate of their ends with yokes 50 fitting over the pivotally connected to the end portions of the cross bar. Engaging the rear-most brackets are cushioning springs 51 surrounding the rods, and mounted upon the forward end portions of the rods are cushioning springs 52 opposed to the first springs and engaging the foremost brackets. The rods carry cap plates 53 overlying the confronting ends of the springs and these plates may be adjustably advanced for tensioning the springs by nuts threaded upon the rods. Otherwise, this modified construction is identical with the preferred form of the invention.

As will be clear, the springs, 51, 52 will co-operate with the springs within the cylinder 46 for cushioning impact against the draw bar and rebound of the same. Thus, freight cars equipped with this form of draft rigging may be readily shifted without likelihood of injury to the cars or injury to the draft rigging, notwithstanding the supply of air may be cut off or the volume of

air be so reduced through leakage as to be of no value.

Having thus described the invention, what is claimed as new is:

1. Draft rigging comprising draft sills, a cylinder rigidly connected at both its ends to the draft sills, a double-headed piston in the cylinder, means for cushioning the movement of the piston toward either end of the cylinder, a draw bar in axial alinement with the cylinder, a cross bar slidably mounted on the draft sills and connected to the inner end of the draw bar, a second cross bar slidably mounted on the draft sills and connected to the piston intermediate the ends thereof, and tie bars connecting the cross bars.

2. The combination of draft sills, a cylinder disposed between the draft sills and provided at both ends with lateral hangers rigidly secured to the sills, a double-headed piston within the cylinder, cushioning springs between the ends of the cylinder and the heads of the piston, means for admitting fluid under pressure to one end of the cylinder, the piston having a longitudinal passage opening through its ends for said fluid, a cross bar secured to the piston intermediate the ends thereof and projecting through the side of the cylinder and slidably supported by the cylinder and the draft sills, a draw bar, and connections between the draw bar and said cross bar.

3. The combination of draft sills provided with front and rear longitudinal slots, a cylinder disposed between the draft sills and rigidly connected at both ends with the said sills and provided intermediate its ends with diametrically opposite longitudinal slots, a double-headed piston within the cylinder, means between the ends of the cylinder and the heads of the piston for yieldably resisting movement of the piston, a cross bar secured to the piston at the center of the same and mounted slidably in the slots in the cylinder and in the rear slots in the draft sills, a draw bar arranged in alinement with the cylinder, a cross bar extending through the inner end of the draw bar and slidably mounted in the forward slots in the draft sills, and tie rods disposed at opposite sides of the cylinder and having their ends encircling the respectively adjacent cross bars.

In testimony whereof I affix my signature.

BRUCE P. STRAW. [L. s.]