Nov. 24, 1959 W. E. WITHALL 2,914,196

DRAFT GEARS FOR RAILWAY DRAFT RIGGING

Filed June 21, 1956 3 Sheets-Sheet 1

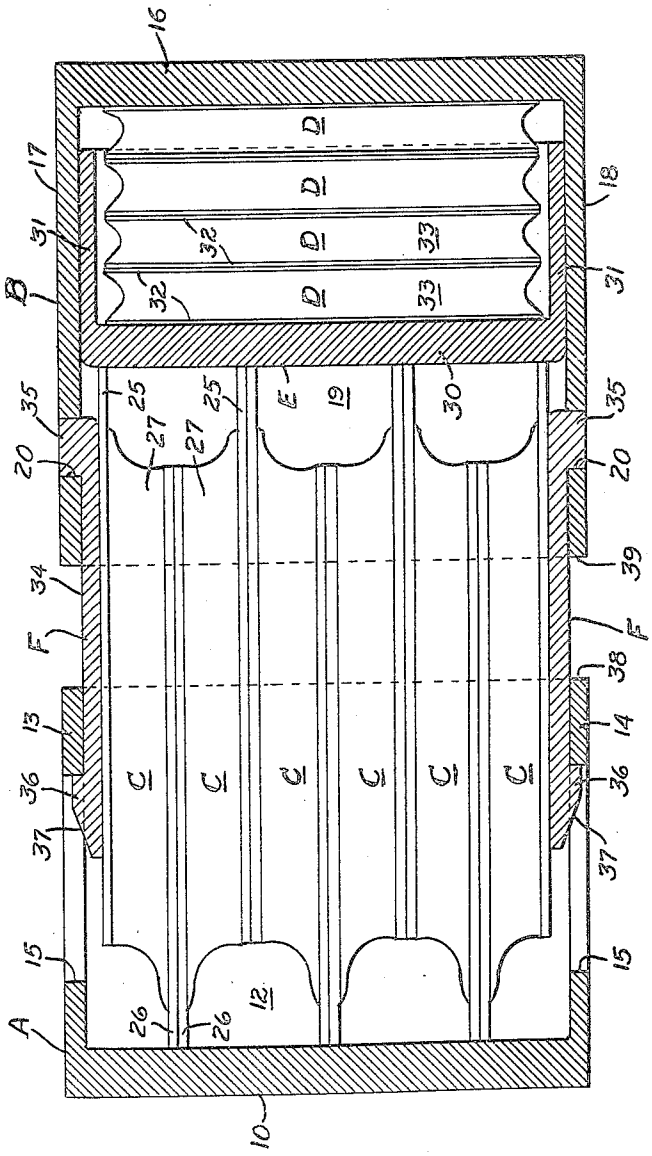


Fig. 1

Inventor:
William E. Withall.
By George H. Simmons
Edward A. Juron
Attys

Nov. 24, 1959 W. E. WITHALL 2,914,196

DRAFT GEARS FOR RAILWAY DRAFT RIGGING

Filed June 21, 1956 3 Sheets-Sheet 2

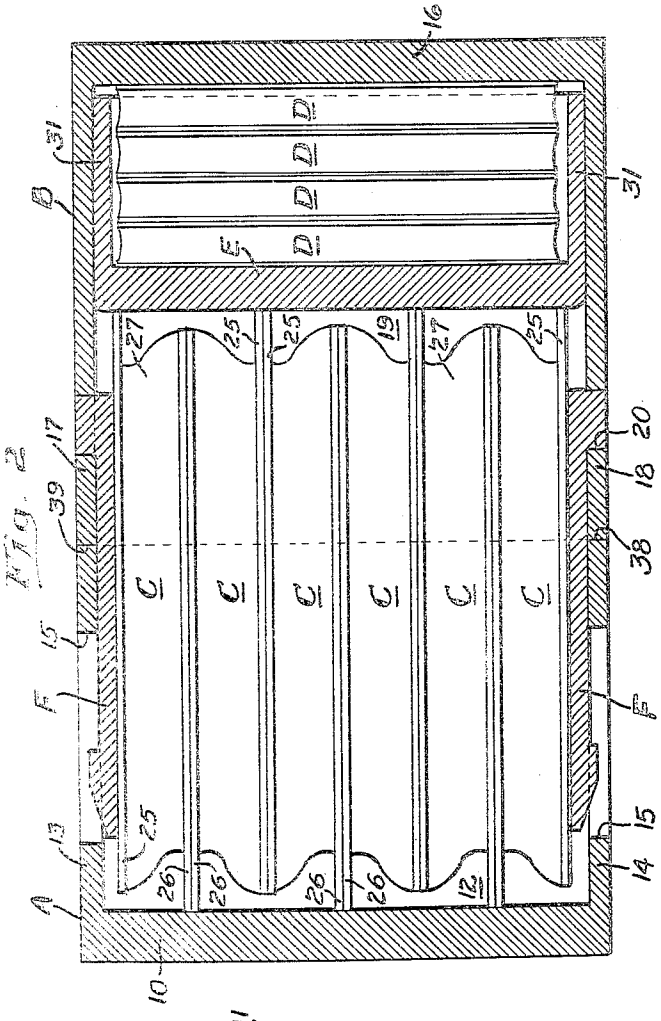


Fig. 2

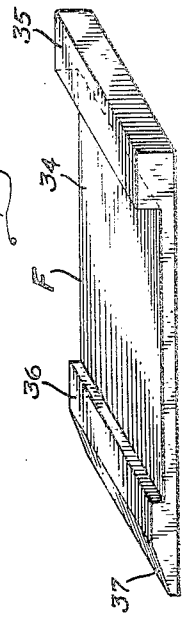


Fig. 4

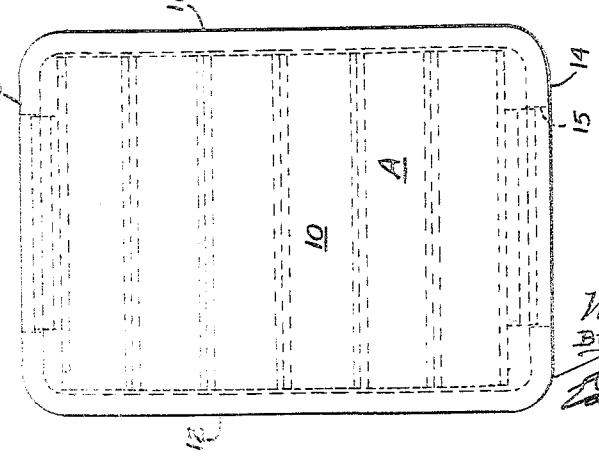


Fig. 3

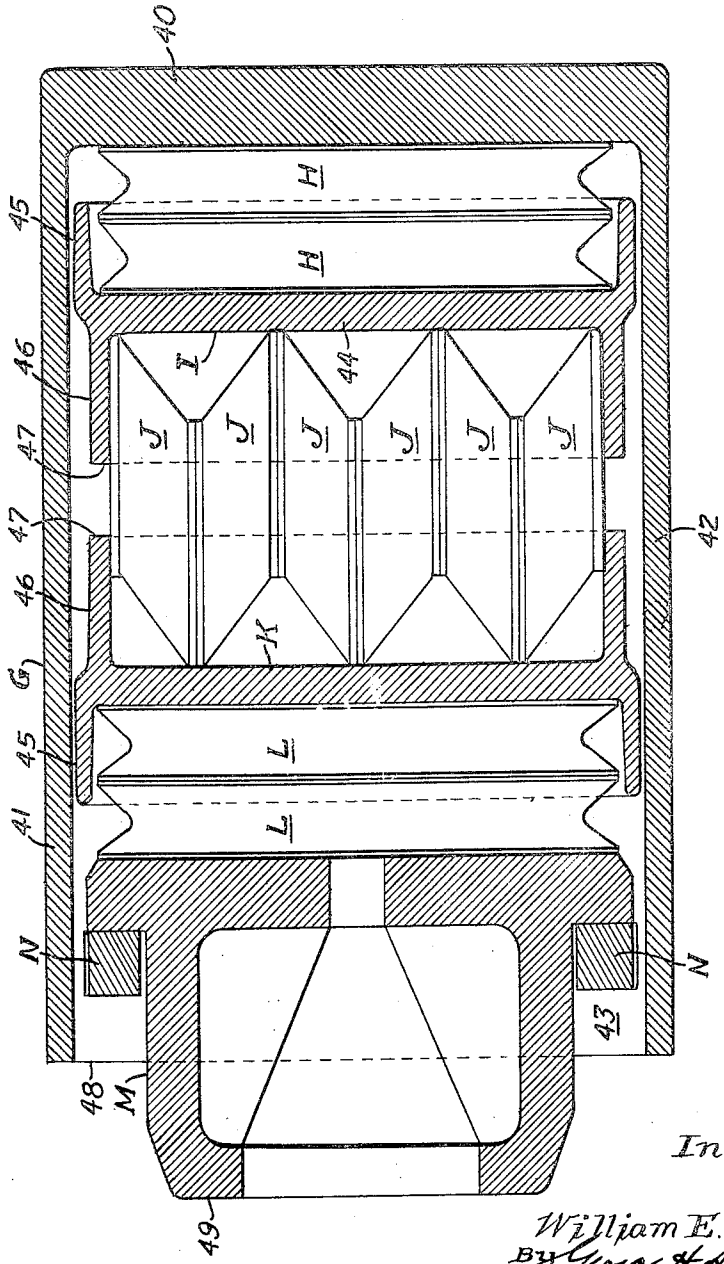
Inventor:
William E. Withall.
By George H. Lippmann
Edward D. Jurow
Attys

Nov. 24, 1959 W. E. WITHALL 2,914,196

DRAFT GEARS FOR RAILWAY DRAFT RIGGING

Filed June 21, 1956 3 Sheets-Sheet 3

Fig. 5



Inventor:

William E. Withall.

By George H. Lemmon

Edward D. Jurow

Atty.

United States Patent Office 2,914,196 Patented Nov. 24, 1959

2,914,196

DRAFT GEARS FOR RAILWAY DRAFT RIGGING

William E. Withall, Hinsdale, Ill., assignor to W. H. Miner, Inc., Chicago, Ill., a corporation of Delaware

Application June 21, 1956, Serial No. 592,961

2 Claims. (Cl. 213—45)

This invention relates to draft gears for railway draft rigging.

It is a main object of the invention to provide a draft gear having a resilient column that is composed in part of units that are stressed in shear only and in part of units stressed in compression only, by operations of the gear in service.

Another object of the invention is to provide a draft gear in which the travel of the shear stressed units is limited to a predetermined amount, thereby limiting the stresses to which these units may be subjected.

Another object of the invention is to provide a draft gear in which the travel of the gear is limited so that the portion of the column that is composed of shear units and the portion that is composed of compression units are both protected from excessive movements thereby to prevent damage to the units.

Further objects of the invention not specifically mentioned here will be apparent from the detailed description and claims which follow, reference being had to the accompanying drawings in which a preferred embodiment of the invention is shown by way of example and in which:

Figure 1 is a cross sectional view along a horizontal plane through a gear in relaxed state with resilient units therein shown in full;

Figure 2 is a view similar to Figure 1, showing the gear fully compressed;

Figure 3 is an end elevational view of the gear;

Figure 4 is a view in oblique projection of a locking plate of a gear; and

Figure 5 is a view similar to Figure 1, showing a modified embodiment of the invention, the resilient units being shown in full.

The gear of the present invention, as shown in Figure 1, consists of a front casing A, a rear casing B, resilient units C that are stressed in shear only, resilient units D that are stressed in compression only, aligning separator E, and locking plates F.

The front casing section consists of a solid front wall 10 from the edges of which are rearwardly extending top and bottom walls 11 and 12 and side walls 13 and 14, the walls 11, 12, 13 and 14 being formed integrally with each other and with the front wall 10.

Side walls 13 and 14 are each provided with a rectangular slot 15 for a purpose presently to appear.

The rear casing section consists of a solid rear wall 16 from the edges of which are forwardly extending side walls 17 and 18, and top and bottom walls, of which the bottom wall 19 appears in Figure 1. The side walls 17 and 18 are each provided with a rectangular slot 20 adjacent the front open end of the casing section.

Disposed within the casing formed by placing the sections A and B with their open ends adjacent and with the side walls aligned is a resilient column consisting of shear units C, each comprising a pair of plates 25 and 26 disposed longitudinally of the gear and a pad of rubber 27 that is interposed between and bonded to the plates.

It will be noted that plates 25 and 26 are longitudinally offset with respect to each other and that the units so formed are rotated when being assembled in the column so that pairs of plates 26 abut against the inner surface of the front wall 10 of the casing and pairs of plates 25 abut against the forward surface of the aligning separator E.

The aligning separator E is of known construction and consists of a front wall 30 disposed substantially parallel to the rear wall 16 of the casing section B, from which front wall 30 are rearwardly extending flanges 31 which have sliding fit with the inner surfaces of the top, bottom and side walls of the casing section.

Fitted within the space between the front wall 30 of the aligning separator and the rear wall 16 of the casing section B is a resilient column D composed of pads of known design and consisting of a pair of spaced apart metal plates 32 and a pad of rubber 33 disposed between and bonded to these plates. Units D are disposed at right angles to the axis of the gear.

The locking plates F, which are two in number, consist of a flat plate 34, at the rear end of which is an outwardly extending lug 35 that is of such dimension as to fit snugly in the slots 20 in the casing section B when the locking plate is positioned within that section, as shown in the drawings. At the opposite end of the plate 34 of the locking plate is a lug 36 that has a taper 37 at its forward end. The lug 36 projects into the slot 15 in the side walls of the front casing section A.

In assembling the gear, the rear casing section B is disposed with its closed end 16 lowermost. Resilient units D and the aligning separator E are then positioned in the casing. Locking plates F are next put in place, and the shear units C are then interposed therebetween. The front casing section A is then registered with the upper ends of the shear units C and pressure is applied thereto to cause the rear ends of the side wall sections 13 and 14 to ride over the tapered surfaces 37 of the locking plate lugs 36. This engagement of the casing walls with the tapered surfaces forces the locking plates inwardly, compressing the shear units C slightly as these plates move inwardly sufficiently to permit the lugs 36 to pass inside of the side wall sections 13 and 14.

This movement of the casing section A towards the casing section B moves the plates 26 of the shear unit C more nearly into transverse alignment with the plates 25—that is, decreases the offset given these plates at the time of molding the rubber pad 27 therebetween, thereby to build up in the units C initial stress in shear.

When the front casing A has thus been moved sufficiently near to the rear casing B to align the rear edge of the lugs 36 on the aligning plates with the rear ends of the slots 15, these lugs snap into registration with the slots—that is, into the position in which they are shown in Figure 1 of the drawings.

As the gear is moved from the relaxed position in which it is shown in Figure 1 to the fully compressed position to which it is shown in Figure 2, units C are stressed in shear and units D are stressed in compression. The maximum travel that the casing sections A and B may have relative to each other is determined by engagement of the end 38 of casing A with the end 39 of casing B, and the stresses applied to the resilient column units are thereby limited.

It will be noted that at the time that ends 38 and 39 abut each other, the forward ends of the plates 25 of the shear units are still spaced away from the inner surface of the front wall 10 of the front casing section A; likewise, the rear ends of the plates 26 of the shear units C are spaced away from the wall 30 of the separa-

tor E. This result obtains because the distance of offset between adjacent ends of the plates 25 and 26 plus the distance through which the transverse units D are compressible is greater than the distance existing between the ends 38 and 39 during non-operating condition of the column. It is to be noted that the rear ends of the flanges 31 on the aligning separator E are spaced away from the forward face of the rear wall 16 of the rear casing section B. Upon release of the pressure moving the casing sections together, stresses built up in the units C and D by this movement restore the units to the positions in which they are shown in Figure 1. In this embodiment of the invention the shear units and the compressed units are stressed simultaneously throughout operations of the gear.

The embodiment of the invention shown in Figure 5 employs a single piece casing G having a solid rear wall 40 from which side walls 41 and 42, bottom wall 43, and top wall (not shown) project, the walls of the casing being formed integrally with each other. Disposed within the casing are rear compression units H, a rear aligning separator I, shear units J, a front aligning separator K, front compression units L, and a plunger M which bears thereagainst and is secured in the casing by locking pins N that project through sockets in the top and bottom walls of the casing in known manner.

The compression units H and L are of known construction, each consisting of a pair of metallic plates between which a rubber pad is disposed and bonded to the plates. The aligning separators I and K are of identical construction, each consisting of a plate 44 from the edges of which a flange 45 extends rearwardly alongside of the compression units H and a second flange 46 extends forwardly alongside of the shear units J. The aligning separator K is placed in the casing in the reverse position with respect to the separator I, as is apparent. The forward compression units L are identical with the compression units H and are of known construction.

It will be noted that the adjacent ends 47 of the flanges 46 on the aligning separators I and K are spaced apart a distance less than the distance between the front end 48 of the casing and the front end 49 of the plunger M.

In this embodiment of the invention the shear units J are of lower resistance than the compression units H and L, with the result that as the plunger is moved inwardly of the casing the initial portion of this movement stresses mainly the shear units J with little or no compression of the compression units H and L. This operation continues until adjacent ends 47 of the flanges 46 on the aligning separators are abutted together, at which time further stressing of the shear units is prevented. Further movement of the plunger compresses the compression units H and L, and this movement may continue until the front edge 49 of the plunger is aligned with the front edge 48 of the casing G. Through this arrangement the gear offers low resistance to the initial portion of its travel and a higher resistance to the latter portion of that travel, which latter resistance builds up rapidly as the compression units H and L are compressed.

While I have chosen to illustrate my invention by showing and describing preferred embodiments of it, I have done so by way of example only, as there are many modifications and adaptations which can be made by one skilled in the art within the teachings of the invention.

Having thus complied with the statutes and shown and described the invention, what I consider new and desire to have protected by Letters Patent is pointed out in the appended claims.

What I claim is:

1. A shock absorbing mechanism for railway draft rigging, comprising a pair of open-ended cup-shaped casing members, each having an end wall and integral upstanding side walls, disposed in alignment with their open ends adjacent to and spaced from each other to form a casing, a plurality of transversely extending rubber units disposed within and engageable with an end wall of the casing, a separator overlying the transverse units and having flanges interposed between such transverse units and the adjacent casing side walls, a plurality of longitudinally extending rubber units within the casing, each of said rubber units consisting of a pair of spaced apart metal plates and a pad of rubber interposed and bonded to said plates, the metal plates of the longitudinal units being offset longitudinally of each other, one plate of each longitudinal unit engaging the other end wall of the casing and the other plate engaging the separator, the distance of offset of the plates of the longitudinal units plus the distance through which the transverse units are compressible being greater than the distance between the abuttable ends of the cup-shaped casing members so that during operations of the mechanism the casing members abut before the pairs of metal plates of each of the longitudinal units move into alignment with each other, a pair of locking plates disposed one on each side of the plurality of longitudinally extending rubber units, a lug projecting outwardly from each end of each locking plate, slots in the side walls of one casing member into which a lug on the locking plate fits to fix the locking plates with respect to said one casing member, and longitudinally elongated slots in the side walls of the other casing member into which the other lugs extend.

2. A shock absorbing mechanism for railway draft rigging comprising an open-ended housing having an end wall and integral upstanding side walls, a pressure transmitting plunger operably movable within the open end of said housing, two groups of transversely extending rubber units, one group disposed in engagement with said plunger and the second group disposed in engagement with the end wall of the housing, a plurality of longitudinal rubber units disposed between said groups of transverse units, each of said rubber units consisting of spaced apart metal plates and a pad of rubber interposed and bonded to said plates, the metal plates of the longitudinal units being offset longitudinally of each other, cup-shaped separator members interposed between the ends of the longitudinal units and the groups of adjacent transverse units, the separator members each comprising a central web having a flange extending between the group of longitudinal units and the adjacent housing side walls, each separator member having another flange which extends in a direction away from the first mentioned flange and which is disposed between the transverse units and the casing, the distance of offset of the plates of the longitudinal units plus the distance through which the transverse units are compressible being greater than the distance between the abuttable ends of the first mentioned flanges on said cup-shaped separators.

References Cited in the file of this patent

UNITED STATES PATENTS

1,683,822	Haseltine	Sept. 11, 1928
2,165,375	Heitner	July 11, 1939
2,738,078	Tucker	Mar. 13, 1956
2,767,858	Fillion	Oct. 23, 1956
2,779,480	Forssell	Jan. 29, 1957