P. BROWN.

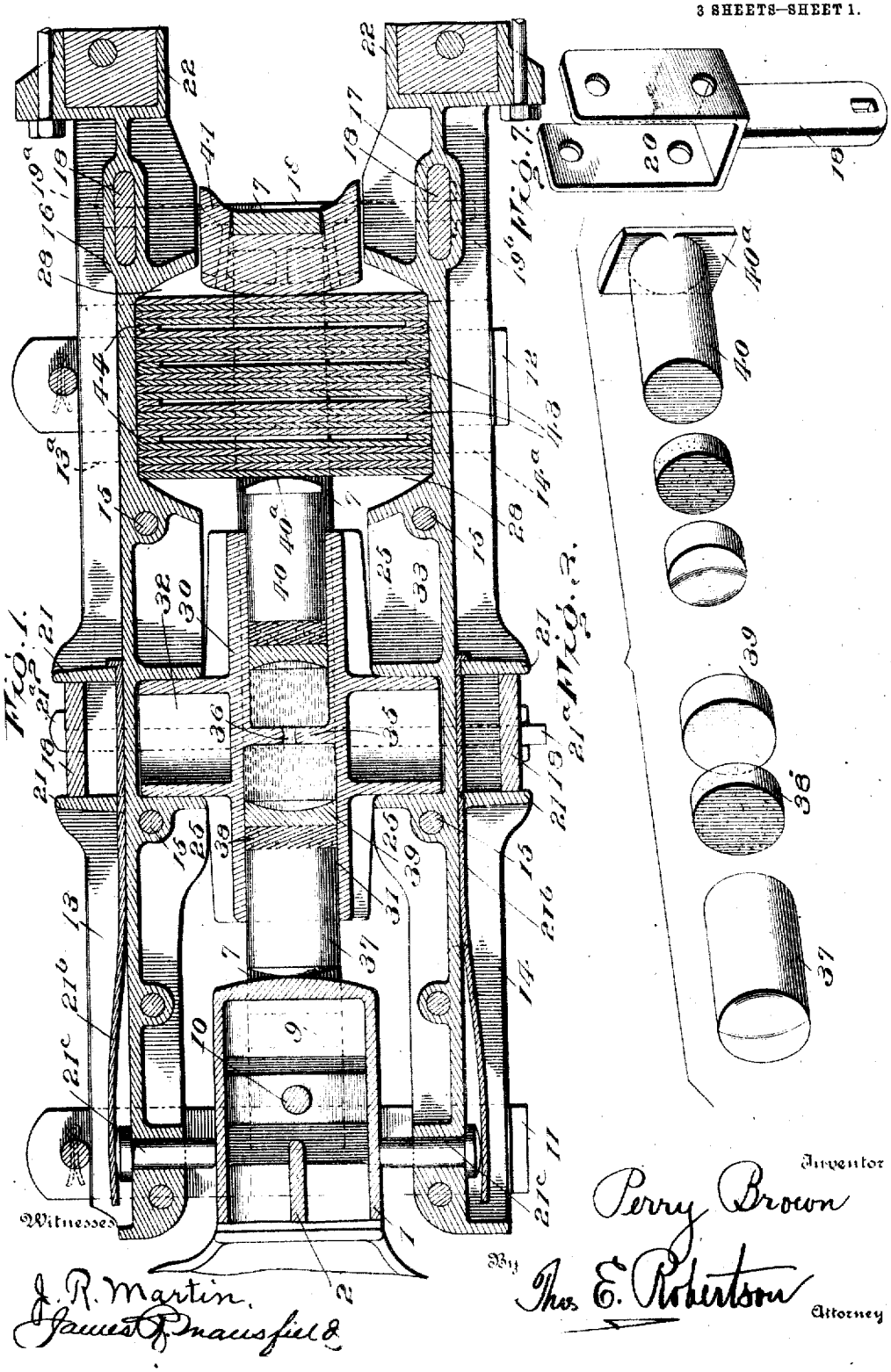
DRAFT RIGGING.

APPLICATION FILED OCT. 23, 1903.

1,005,100.

Patented Oct. 3, 1911.

3 SHEETS—SHEET 1.



Witnesses

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James L. Mansfield

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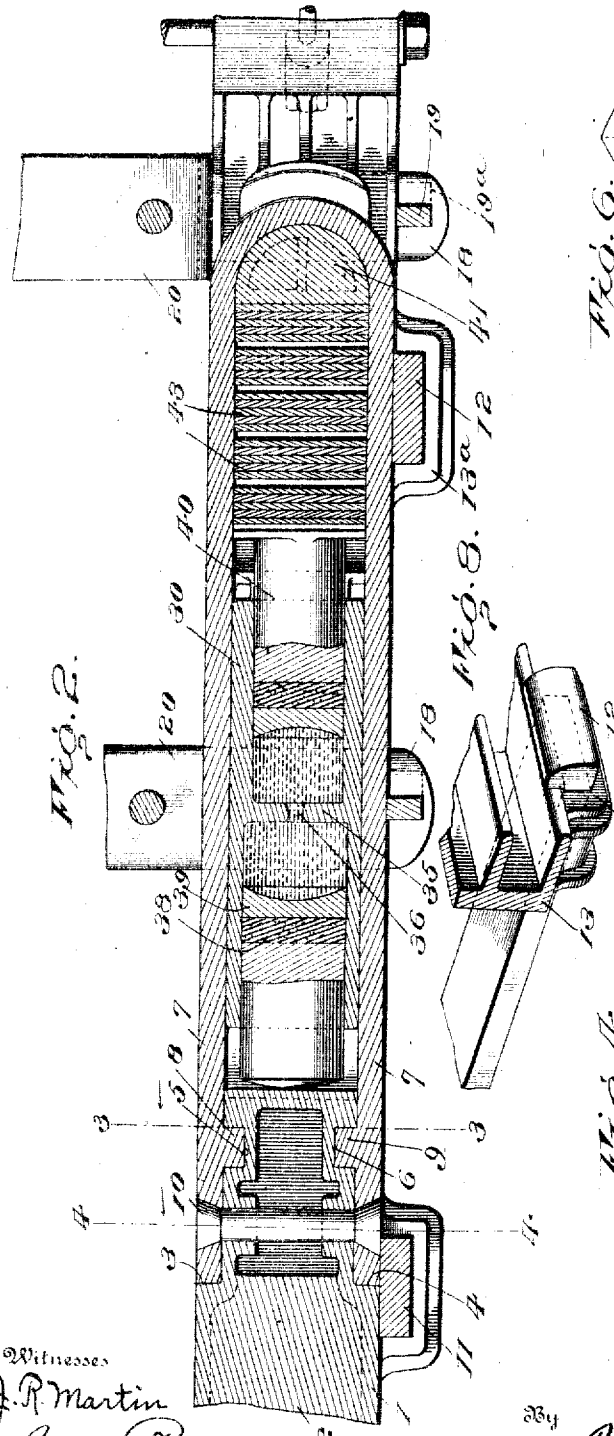

Fig. 2.

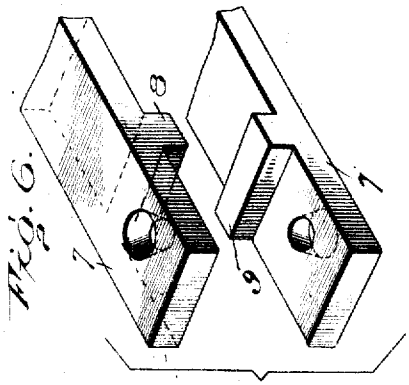

Fig. 6.

Fig. 8.

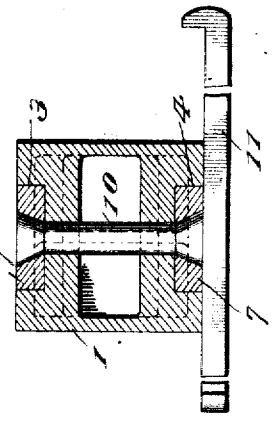

Fig. 5.

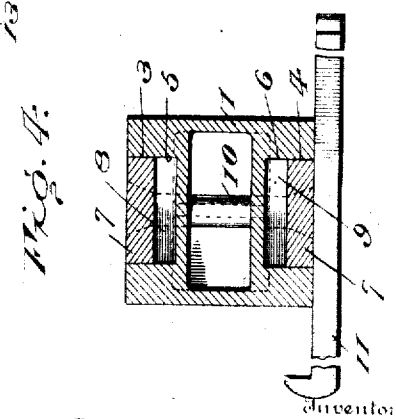

Fig. 4.

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3 SHEETS—SHEET 3.

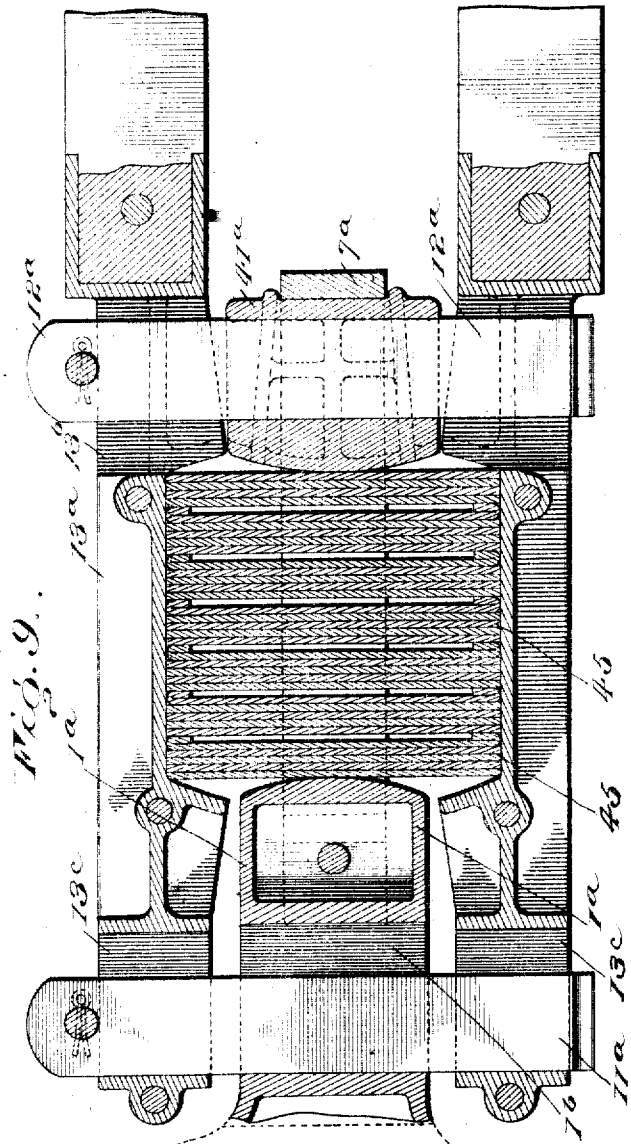

Fig. 9.

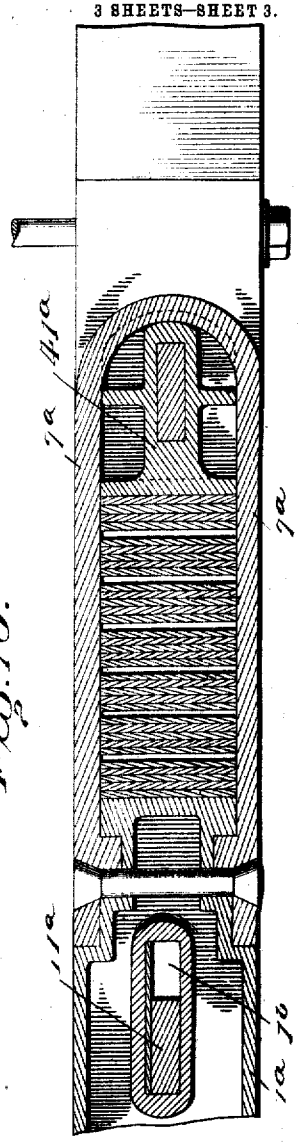

Fig. 10.

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UNITED STATES PATENT OFFICE.

PERRY BROWN, OF WILMINGTON, DELAWARE.

DRAFT-RIGGING.

1,005,100. Specification of Letters Patent. Patented Oct. 3, 1911.

Application filed October 23, 1903. Serial No. 178,244.

To all whom it may concern:

Be it known that I, PERRY BROWN, a citizen of the United States of America, and resident of Wilmington, in the county of Newcastle, in the State of Delaware, have invented certain new and useful Improvements in Draft-Rigging, of which the following is a specification.

This invention relates to certain new and useful improvements in draft rigging for railway cars and the main objects of my invention are to provide a simpler form of springs than those now in use and to form a fluid or hydraulic cushion which will absorb heavy blows with the least effect.

In addition to these two main objects, my invention is also designed to improve the "rigging" generally and especially the "draft irons" and the method of supporting the same.

With this brief statement, my invention consists in the device as shown in its preferable embodiment in the drawings accompanying and forming part of this application and will be hereinafter more fully defined by the claims.

Referring now to the aforesaid drawings, Figure 1 is a horizontal central section of my draft rigging, viewed from above; Fig. 2 is a longitudinal vertical section of the same; Fig. 3 is a perspective view of a few of the parts of the fluid cushion; Figs. 4, 5 and 6 are details of the arrangement for securing the yoke or strap to the shank of the coupler; Fig. 7 is a perspective view of one of the hangers for supporting the draft irons; Fig. 8 is a perspective view of a portion of one of the draft irons showing my arrangement of forming loops on the bottoms of the irons through which pass the flat bars for supporting the rigging; Fig. 9 is a horizontal section, viewed from above, of my invention without the fluid cushion; and Fig. 10 is a vertical central section of the same.

Referring now to the details of the drawings by numerals: 1 designates the shank of the coupler which may be made of any approved shape, although I prefer that shown in my drawings and which is shown in Fig. 1 as cored out to provide a shell of great strength and minimum weight and which is strengthened by means of the vertical rib 2 shown in Fig. 2 as extending from the top wall to the bottom wall of the shank. The shank 1 is further made of peculiar shape in that it has a groove or recess 3 on its upper side and a similar groove or recess 4 in its lower side; these grooves running lengthwise of the shank for the reception of the yoke or strap to be described. These grooves or recesses 3 and 4 are preferably of angular shape, instead of being round, and the shank is also provided with transverse grooves or recesses 5 and 6 which enter the grooves or recesses 3 and 4. The strap or yoke 7 which coacts with these grooves in the shank 1 may be of the ordinary form so far as whether it is made of two pieces secured together at their rear ends or as to whether it is of the continuous form shown in Fig. 2. In either case, the front ends of the yoke are provided with transverse ribs 8 and 9, illustrated particularly in Fig. 6, which enter the grooves or recesses 5 and 6 before referred to. When these transverse ribs 8 and 9 are seated in their grooves 5 and 6, the ends of the shank or yoke fit within the angular grooves or recesses 3 and 4 in the shank 1, as very clearly illustrated in Figs. 4 and 5. The especial purpose of this structure is to prevent the "shearing" of the bolt or bolts which secure the yoke or strap to the shank of the coupler. In the form shown, I employ a single fastening pin or bolt 10, but it is obvious that more than one may be employed if desired. In actual practice, I have found that no matter if three of these bolts or pins are used, there is a great tendency of the shank of the coupler to turn in the yoke or strap, and the result is that the bins or bolts will be sheared off. Even if three bolts or pins are used, the center one acts as a pivot and the other two are frequently badly sheared. I therefore employ the construction just described, and find that when the strap or yoke is seated within longitudinal angular recesses in the shank of the coupler, this shearing is prevented, and if the transverse ribs are also employed, a single pin or bolt is ample to rigidly secure the parts together.

In the form shown in Figs. 1 and 2, the yoke 7 is of the continuous character, and is supported near its front and rear ends by means of two preferably flat bars 11 and 12 which pass through loops 13^a and 14^a formed integral with the draft irons 13 and 14, as shown in the detail Fig. 8. These draft irons 13 and 14 are secured to the

longitudinal sills (not shown) by means of the usual bolts 15, but at their rear ends I prefer to form them with cast loops 16 and 17 forming recesses in which pass stems 18 of hangers 20 (see Fig. 7) which are forked at their upper ends to straddle the longitudinal sills of the car, to which they may be bolted or otherwise secured. In order to prevent the draft irons from spreading, I pass a bar 19 from one shank to the other the bar having a head 19^a at one end and a pin or cotter 19^b (see Fig. 1) at the other. In order to prevent the draft irons 13 from spreading at their center portions, I cast or rivet to them ribs 21 as seen in Fig. 1, and two hangers like that shown in Fig. 7 coact with these ribs 21 by having their shanks 18 pass between the ribs where they are secured by a bar 21^a similar to bar 19. These ribs 21 also serve another purpose, that of keepers for flat springs 21^b whose office is to hold the plungers 21^c against the shank 1 of the coupler and thus keep the coupler in a central position and yet permit it to swing from one side to the other, as necessary. The ends of the draft irons 13 and 14 are further provided with pockets 22 to receive the fillers.

In the preferred embodiment of my draft irons, I form them with flanged portions 25 which form pockets for a purpose to be hereinafter described, and at the rear of these pockets are formed spring pockets 28 for receiving the springs as will also be described. This, as will be obvious from an inspection of my drawings, makes an exceptionally strong construction of draft irons, and one which is not likely to get out of order.

Between the draft irons 13 and 14 is placed a casting 30, which is formed with a cylindrical bore 31 running lengthwise of the same, and extending from this casting, at right angles to the bore, are two flanged portions 32 and 33 which enter the pockets between the ribbed portions 25, as clearly illustrated in Fig. 1. This casting is made very heavy and is also provided with ribs, as it has to withstand and transmit to the draft irons most of the strain of the blows delivered to the coupling head. One other novel feature of this central casting 30 is that its bore 31 is almost closed by a wall 35, which is provided with a perforation 36 for a purpose to be described. The bore in the front end of the casting is also preferably larger than the bore at the rear end of the casting, the purpose of which will also be hereinafter described. Working in the front bore is a plunger or piston 37 behind which is packing 38, against which is a concaved or cup-shaped filler or follower 39, and these parts are duplicated in the rear end of the casting, as clearly shown. In normal action, the front piston 37 contacts with the rear end of the shank 1 of the coupler, or if desired, any form of springs may be interposed between these parts. At the rear end of my rigging, I place a filler or block 41 at the rear end of the strap or yoke 7, which filler or block has a groove in which the yoke 7 fits. The rear piston 40 is like the front piston 37 except that it is provided with a head 40^a shown in Fig. 3; this head being adapted to fit vertically between the members of the strap or yoke 7 and prevent the piston from turning, for a purpose to be described.

Between the head of the rear piston 40 and the filler or block 41 may be secured any preferred form of springs or tension mechanism, but I much prefer the novel form shown in my drawings and which may be described as follows: As shown in Fig. 1, my springs, or most of them, are nothing more than flat spring plates 43 which are preferably of about one quarter of an inch in thickness. Preferably each fifth plate is provided with a turned edge 44 which makes a space between each fifth and sixth plates. Of course this space may be provided in other ways, and I do not limit my invention to plates with their ends turned, nor to the spaces being left between the fifth and sixth plates, as the spaces may be left wherever desired. The action of these plates is very gradual and uniform and yet there is sufficient action to withstand heavy loads. It will be seen that at the first slight shock, say on a "pull", the filler or block 41 will be drawn against the rear spring plates and said plates will be moved one quarter of an inch before they are moved sufficient to close the space between the next set of plates; further action will of course move the next set of spring plates until the second space is taken up; and so on until the spring plates are all moved until their centers touch and there is no space between them. If the plates are spaced one quarter of an inch apart, this will accommodate a movement of one inch, and if the load is unusually heavy, all the spring plates will then be sprung forward at once until their limit is reached. But by providing the plates with spaces between them, as described, I am enabled to provide a spring mechanism which acts to gradually absorb the blow; and on the return action, of course there is the same gradual movement which insures as gradual an action as before referred to.

In addition to the springs just described, I employ, in the form shown in Figs. 1 and 2, a liquid or hydraulic cushion between the pistons 37 and 40, which cushion consists of nothing more than a body of oil or other suitable liquid which normally fills the openings or bore of the casting 30 between the two pistons. As best seen in Figs. 1 and 3, this oil or heavy liquid, in the normal position of the parts, is nearly equally distrib-

uted on opposite sides of the dividing wall 35, and the packing 38 and the concaved fillers or followers 39 act to retain the oil in the bore of the casting, as the harder the pistons 37 or 40 are driven against their packings, the harder the packings are condensed against the fillers 39, and hence the packings will at all times insure an absolutely tight fit and thus prevent the escape of the fluid. The rear fluid pocket has been described as of smaller bore than the front one and this is for the purpose of causing the parts to move farther back of the central portion than it does when moving forward of that portion. This is sometimes necessary where there is limited space at the front end of the rigging. The piston 40 which closes the rear fluid pocket or bore has been described as having a head 40^a. This head serves a double purpose: first, its acts upon the spring plates and for that purpose is curved so that when it pushes against them, its curvature is the same as the curvature of the plates, and second, its flat sides act against the strap or yoke and prevent it from turning, so that the curved end is always presented in the proper way. It will be obvious that the opening in the wall 35 may be as large or small as necessary, or there may be a series of openings or there may be only one opening which may be controlled in its size by a detachable reducer.

In the forms shown in Figs. 9 and 10, I have dispensed with the fluid cushion, and employ spring plates 45 identical with the plates shown in Figs. 1 and 2, except that these plates are acted on at one end by the shank 1^a of the coupler without the interposition of the fluid cushion and at the other end by a filler 41^a brought into play by the yoke or strap 7^a and supported by a flat bar 12^a which, instead of passing under the yoke or strap as in Figs. 1 and 2, passes through said filler or follower 41^a. This flat bar 12^a also passes through slots 13^b in the draft irons 13^a as seen in Fig. 9. At the front end, the shank 1^a of the coupler is also provided with a slot 1^b through which passes a flat bar 11^a similar to the flat bar 11 of Fig. 1. This flat bar 11^a also passes through slots 13^c in the front ends of the draft irons, as clearly illustrated in Fig. 9.

The operation of my invention is as follows: On an impact, see especially Figs. 1 and 2, the shank 1 of the coupler acts directly upon the front piston 37 and pushes the packing and filler 39 to the rear, thus causing the liquid to flow as rapidly as the opening in the dividing wall 35 will permit, into the rear chamber behind said wall 35. As fast as the fluid is forced through the wall, it forces the filler, packing and rear piston 40 against the spring plates 43, and instead of acting all at once on the springs, the piston 40 will act first on the first set until the gap between them and the next set is closed; then the first two sets of spring plates are sprung to the rear until the second gap or space is closed, and if the impact is of sufficient force, all the sets of plates are sprung back until all the gaps or spaces are closed, and any further pressure causes all the spring plates to move at once farther until the limit of movement is reached. It will of course be understood that the spring plates naturally re-act and as soon as the pressure on the coupling is relieved the plates assume their normal positions and gradually return the parts to the position shown in Fig. 1, the fluid of course also being returned. Of course if the car is being drawn, the coupler and its shank, through the yoke or strap, acts on the rear of the spring plates, and the action is precisely similar, though in a contrary direction, to the one just described. It will thus be seen that not only do I provide a spring mechanism which gradually absorbs the shock before transmitting it to all the springs at once, but I also have provided a fluid or hydraulic device which acts as a damper upon any sudden shock or impact, and transmits it gradually or only as the fluid can pass through the dividing wall 35 to the spring mechanism, if such is used.

In the form shown in Figs. 9 and 10, the shock of the impact is transmitted direct from the shank of the coupler to the spring plates, but the action will be the same gradual action as explained in the description of the operation of the spring plates of Figs. 1 and 2.

As I have before explained, my drawings illustrate the preferable embodiment of my invention and changes may be made as may be necessary without departing from the spirit thereof.

What I claim as new is:

1. In draft mechanism, and in combination with the coupler, a plurality of series of spring plates receiving the blow from said coupler and having spaces left between each series of plates, said spaces being near the central portion of said plates and the plates between each series having overturned edges, said edges being substantially immovable, substantially as described.

2. In draft mechanism, and in combination with the coupler, spring plates receiving the blow from said coupler, said plates having their ends substantially immovable and having spaces left between their central portions, substantially as described.

3. In draft mechanism, and in combination with the coupler, a plurality of series of spring plates receiving the blow from said coupler, said plates having their ends substantially immovable and a space being left between each series of plates near their centers, substantially as described.

4. In draft mechanism, spring mechanism for absorbing the blow comprising a plurality of series of spring plates, each series being formed of a plurality of plates with the plate between each series having overturned ends, substantially as described.

5. In draft mechanism, the combination of draft irons having pockets therein, and a series of spring plates having their ends located within said pockets and having spaces left between their central portions whereby they may "give" at the center, substantially as described.

6. In draft mechanism, the combination of draft irons having pockets therein, a coupler having its shank located between said draft irons, a yoke or strap connected with the shank of said coupler, and spring plates within said yoke or strap having their ends projecting into said pockets in said draft irons, said spring plates having openings between them at their central portions, substantially as described.

7. In draft mechanism, the combination of draft irons, a coupler having its shank interposed between said irons, a series of springs co-acting with said draft irons and absorbing the blow from said coupler, and a fluid cushion also co-acting with said coupler and spring plates, substantially as described.

8. In draft mechanism, the combination of draft irons, a coupler having its shank located between said irons, spring plates co-acting with said draft irons and said coupler to absorb the blow and a fluid cushion also co-acting with said parts to assist in absorbing the blow, substantially as described.

9. In draft mechanism, the combination of draft irons, a coupler having its shank between said irons, a casting or support carried by said draft irons, and a fluid cushion contained in said casting or support and co-acting with the coupler to absorb the blow therefrom, substantially as described.

10. In draft mechanism, the combination of draft irons having pockets therein, a coupler having its shank between said draft irons, a casting or support having projecting portions entering said pockets, and a fluid cushion contained in said casting or support and co-acting with said coupler to absorb the blow therefrom, substantially as described.

11. In draft mechanism, the combination of a coupler, a casting or support at the rear of said coupler, means for carrying said casting or support, said casting or support having a fluid cushion therein and a piston interposed between said fluid cushion and said coupler, substantially as described.

12. In draft mechanism, a fluid cushion comprising a suitable casting or support having an opening or bore therein, pistons at opposite ends of said bore, and a dividing wall between said pistons and having an opening therein, substantially as described.

13. In draft mechanism, the combination of draft irons, a coupler having its shank between said irons, spring plates having their ends supported in pockets in said draft irons, a casting or support also held by said draft irons, and a fluid cushion formed in said casting or support comprising two pistons therein, one piston acted upon at one end by the spring plates and the other by the coupler, substantially as described.

14. In draft mechanism, the combination of draft irons having two sets of pockets therein, a coupler, springs co-acting with one set of pockets, a casting or support co-acting with the other set of pockets, a yoke connecting the coupler with said spring plates, and a fluid cushion contained within said casting or support and comprising two pistons, one co-acting with the spring plates and the other with the coupler, substantially as described.

15. In draft mechanism, the combination of draft irons having openings therein and a hanger adapted to be secured to the timbers and having a shank passing through said openings, substantially as described.

16. In draft mechanism, the combination of draft irons having an opening therein, and hangers having their shanks passing through said openings, said shanks having their upper ends forked and adapted to straddle the timbers, substantially as described.

17. In draft mechanism, the combination of draft irons having openings therein, hangers adapted to be secured to the timbers and having their shanks passing through said openings, and means for connecting the bottoms of said shanks whereby the draft irons are prevented from spreading laterally, substantially as described.

18. In draft mechanism, the combination of draft irons having ribs projecting therefrom, hangers having shanks projecting between said ribs, and means for connecting said hangers beneath the draft irons, whereby said draft irons are prevented from spreading, substantially as described.

19. In draft mechanism, the combination of draft irons having ribs projecting therefrom, hangers having their upper ends forked and their shanks projecting between said ribs, and means for connecting said hangers beneath the draft irons, whereby said draft irons are prevented from spreading, substantially as described.

20. In draft mechanism, the combination of draft irons, a coupler having its shank located between said irons, plungers carried by said draft irons and co-acting with the shank of said coupler, and flat spring plates

carried by the draft irons and normally holding said plungers in position, substantially as described.

21. In draft mechanism, the combination of draft irons, a coupler having its shank located between said draft irons, plungers carried by said draft irons and co-acting with said shank, ribs formed on said draft irons, a hanger located between said ribs, and a flat spring co-acting with said plungers to hold them in position, said flat spring being held in position by passing through slots behind said ribs, substantially as described.

22. In draft mechanism, the combination of draft irons having ribs near their central portions and loops near their rear ends, and hangers adapted to be secured to the timbers and having their shanks passing between said ribs and through said loops, substantially as described.

23. In draft mechanism, the combination of a coupler having an angular recess or groove running lengthwise thereof and a yoke or strap sustaining the spring or tension mechanism, said yoke or strap fitting in said angular recess or groove, substantially as described.

24. In draft mechanism, the combination of a coupler having angular grooves or recesses in its top and bottom sides running longitudinally thereof, and a yoke or strap having its ends fitting within said angular openings or recesses, substantially as described.

25. In draft mechanism, the combination of a coupler having angular grooves in its top and bottom sides, said grooves running longitudinally of the shank of the coupler, and a strap or yoke having its ends fitting within said longitudinal grooves, transverse grooves or recesses also formed in said shank, and transverse ribs on the ends of the said yoke fitting within said transverse grooves, substantially as described.

Signed by me at Washington, D. C., this 16th day of October 1903.

PERRY BROWN.

Witnesses:

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JOHN L. FLETCHER.