

No. 731,725.

PATENTED JUNE 23, 1903.

J. M. WAUGH.
DRAFT RIGGING FOR RAILWAY CARS.

APPLICATION FILED JAN. 24, 1902.

NO MODEL.

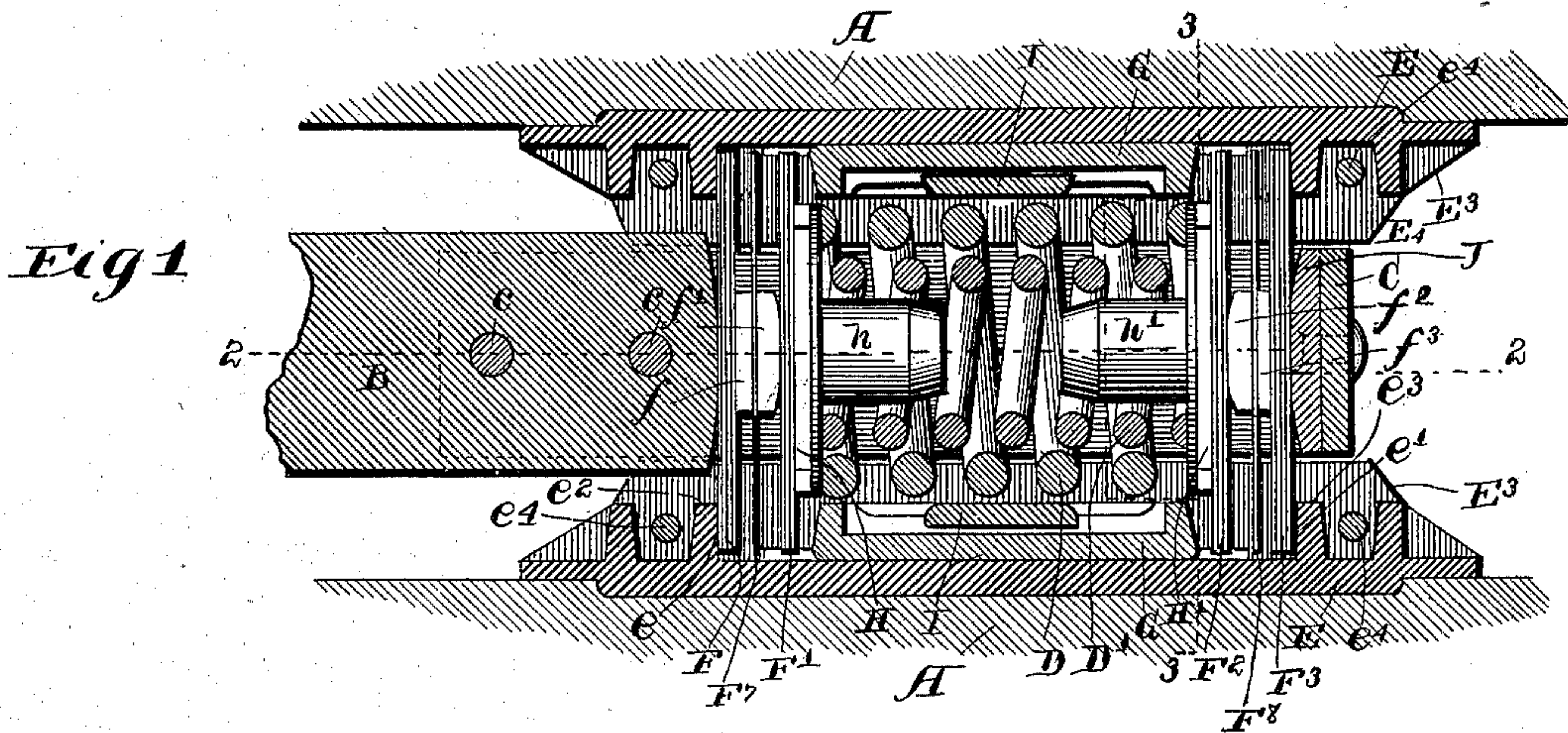


Fig 2

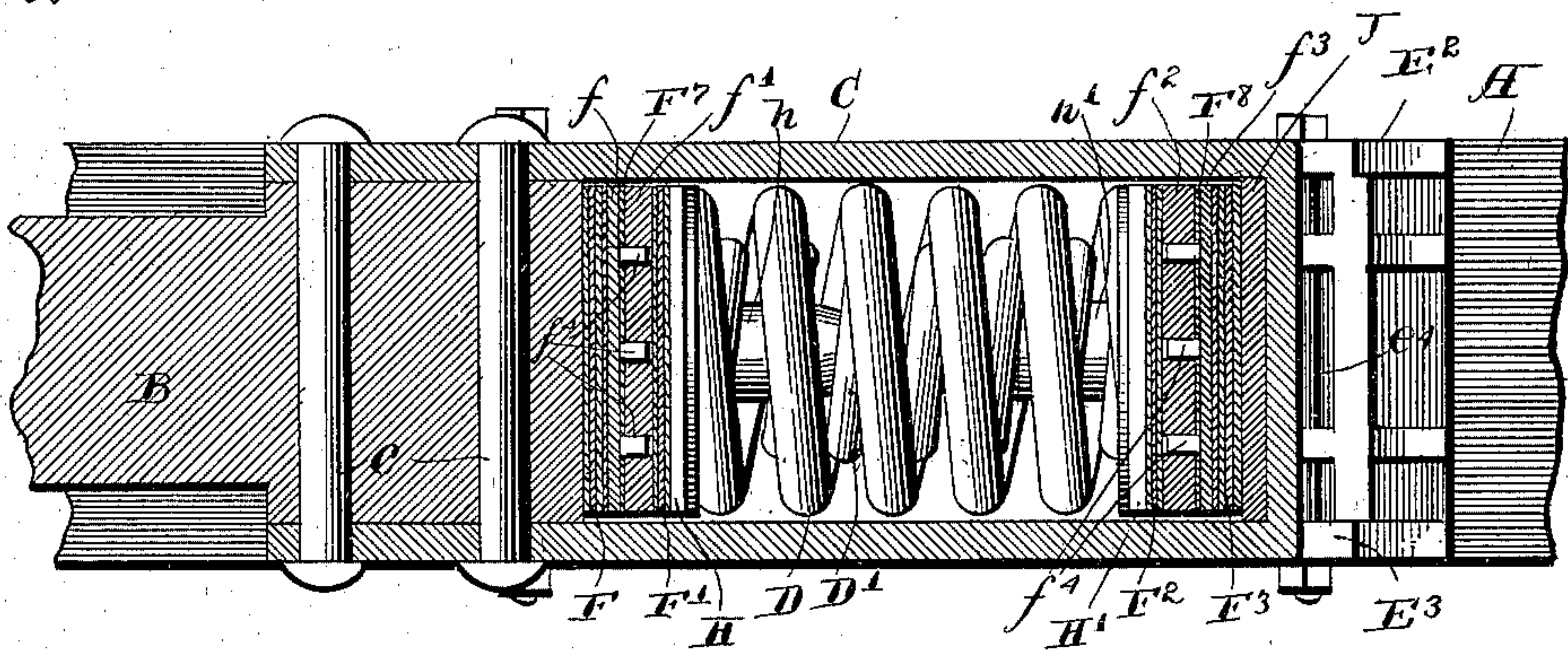


Fig 3

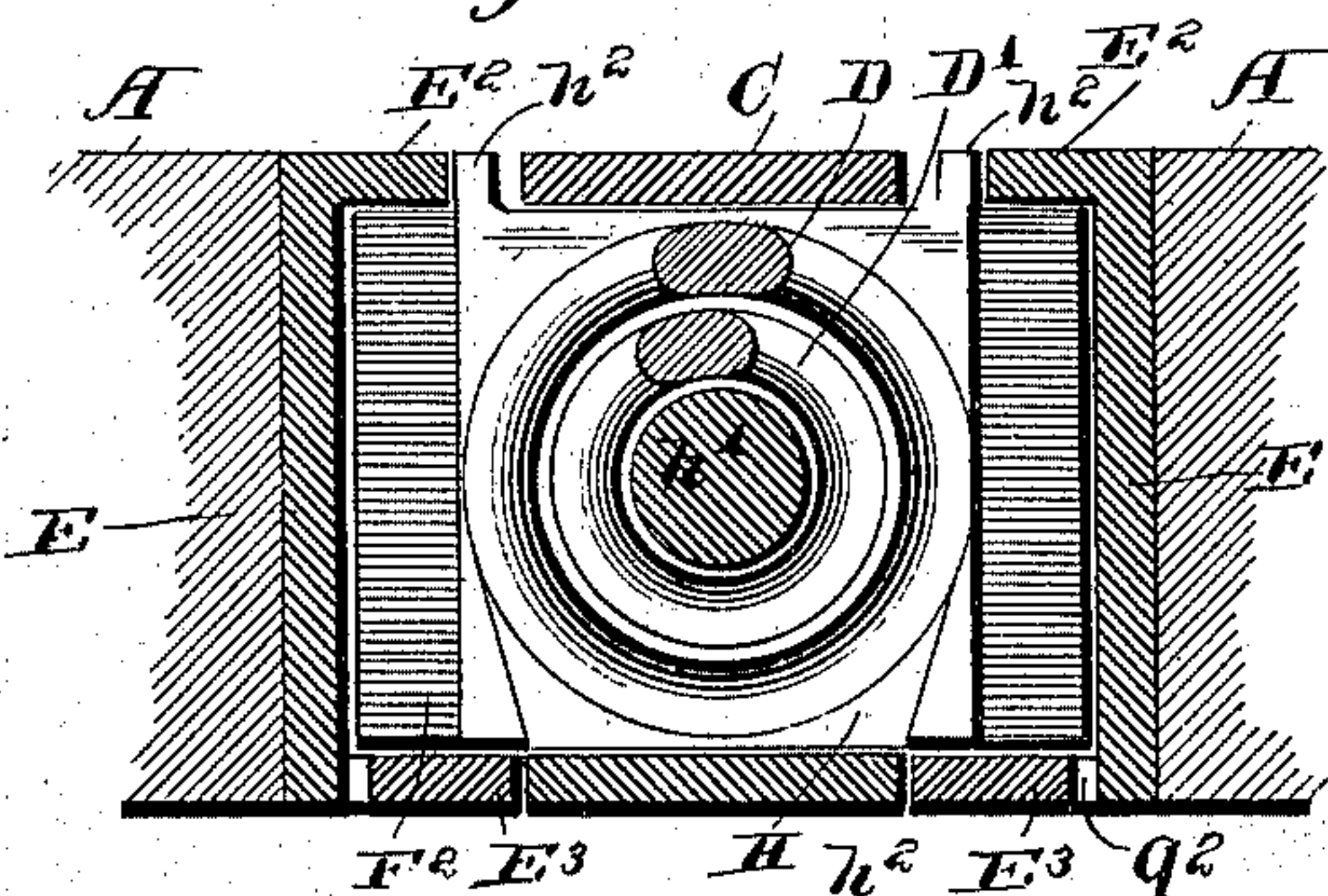


Fig 5

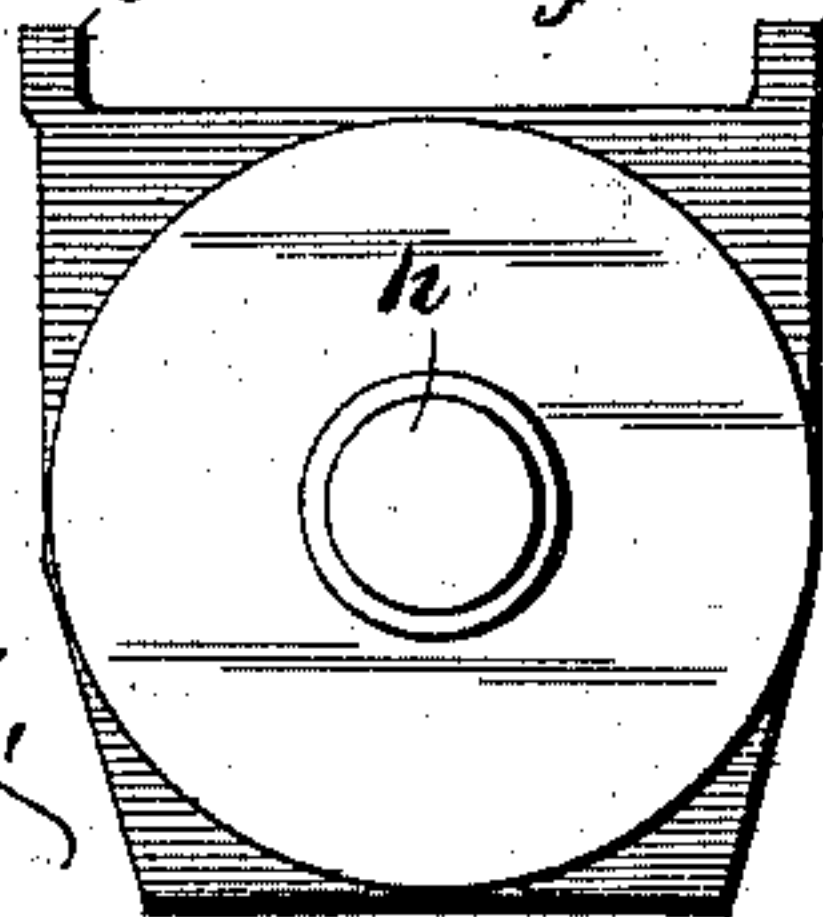


Fig 4

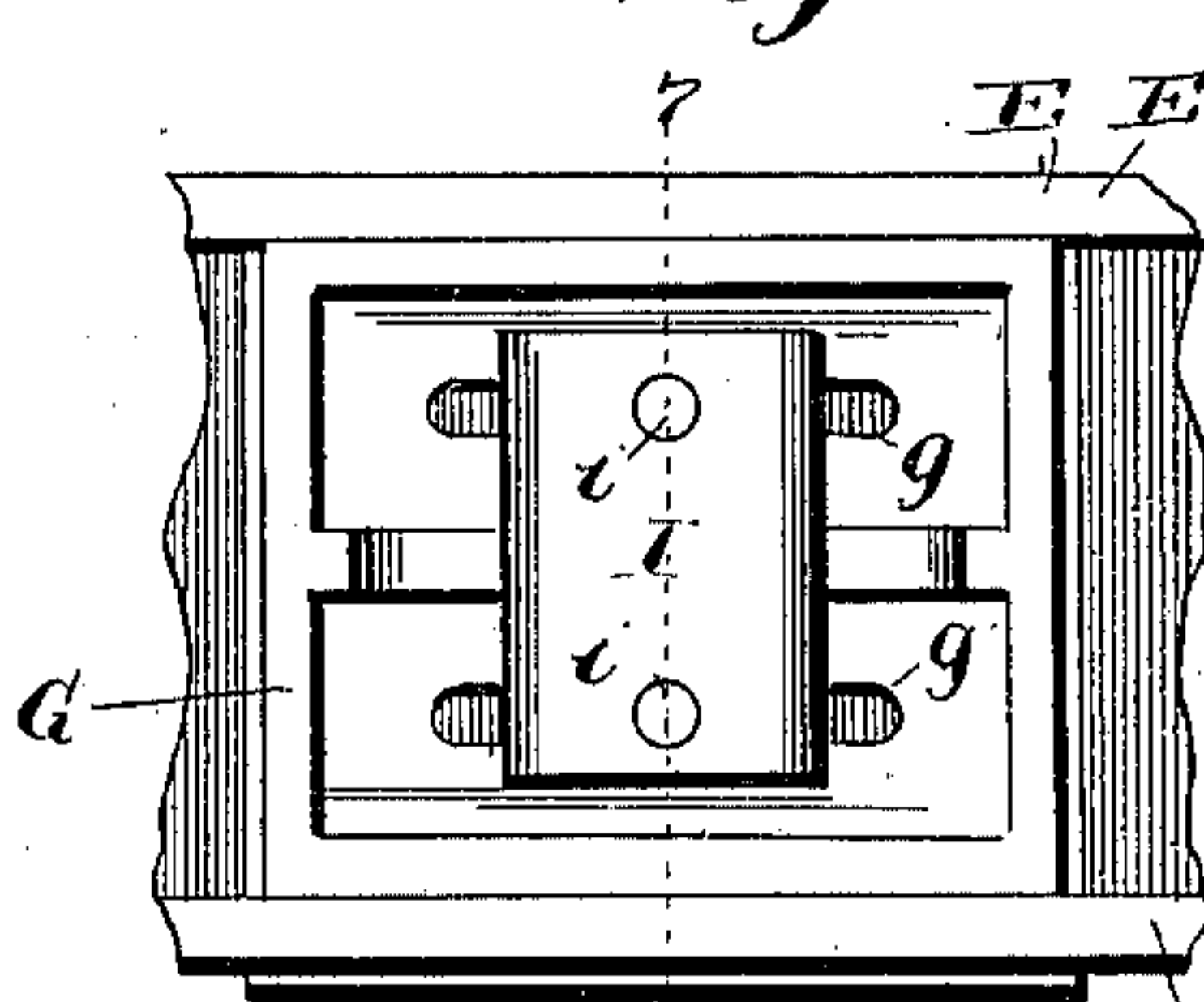
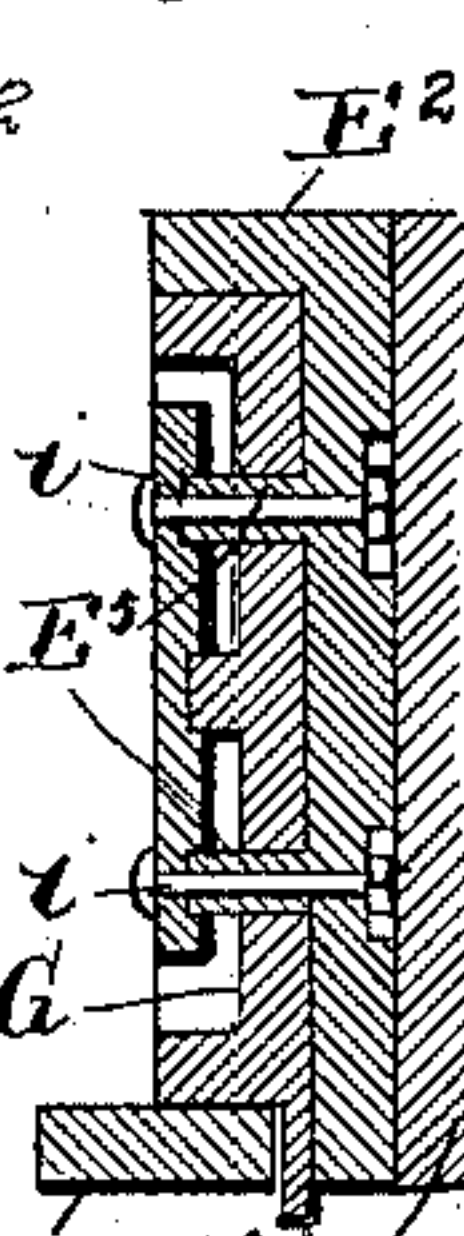


Fig 6



Fig 7



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UNITED STATES PATENT OFFICE.

JAMES MILTON WAUGH, OF CHICAGO, ILLINOIS.

DRAFT-RIGGING FOR RAILWAY-CARS.

SPECIFICATION forming part of Letters Patent No. 731,725, dated June 23, 1903.

Application filed January 24, 1902. Serial No. 91,029. (No model.)

To all whom it may concern:

Be it known that I, JAMES MILTON WAUGH, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Draft-Rigging for Railway-Cars; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to coupling devices for railway-cars, and more especially to the connections between the draw-bar and draft-sills, whereby a cushioned graduated resistance to the shocks occurring in coupling or due to variable strains in traction are obtained.

The invention herein described relates more particularly to that class of connecting devices between a draw-bar and the draft-sills of a car, such as is illustrated in Letters Patent No. 683,236, issued to me September 24, 1901, wherein a coiled draw-bar spring is used in connection with spring follower-plates.

The invention consists in the matters hereinafter set forth, and more particularly pointed out in the appended claims.

In the accompanying drawings, which illustrate in one practical form the several features constituting my invention, Figure 1 is a plan section, taken horizontally through the central axis of the coiled draw-bar spring and showing the end portions of the draft-sill, the draft-irons thereon, the rear or inner portion of the draw-bar, and the parts constituting my invention associated therewith. Fig. 2 is a vertical section of the same parts, taken on line 2 2 of Fig. 1, showing the draw-bar spring in side elevation. Fig. 3 is a cross-section taken on line 3 3 of Fig. 1. Fig. 4 is a similar section taken on line 4 4 of Fig. 1. Figs. 5 and 6 are face and side views of one of the bearing-plates shown in Figs. 1, 2, and 3. Fig. 7 is a detail section taken on line 7 7 of Fig. 4.

As shown in the drawings, A A indicate the end portions of the draft-sills, which form parts of the floor-frame of the car.

B indicates a draw-bar, which is located centrally between the draft-sills and is provided with a yoke C, which is formed by

means of a bar of steel bent between its ends into U form and having its side parts arranged horizontally and parallel with each other, with its ends overlapping the top and bottom surfaces of the inner end of the draw-bar, to which it is secured by means of bolts or rivets *c c*. In the construction illustrated two draw-bar springs D D' are used, the same being of coiled form and located one within the other.

E E designate recessed draft-irons, which are secured to the inner surfaces of the draft-sills.

At each end of the springs D D' is located a set of transversely-arranged spring follower-plates, the ends of which extend into the recesses of the draft-irons. The follower-plates constituting the set at the outer end of the said springs D D' are indicated by the letters F F', the same being located between the end of the spring and the inner end of the draft-bar B. The follower-plates constituting the set at the inner end of said springs D D' are indicated by F² F³ and are located between said springs and the inner end of the draw-bar yoke C. The draft-irons are provided on their adjacent faces with vertical shoulders *e e'* for contact with the ends of the said spring follower-plates. The shoulders *e* face inwardly and are adapted for contact with the follower-plates F, while the shoulders *e'* face outwardly and are adapted for engagement with the ends of the follower-plates F³. Said shoulders *e e'* are formed by means of integral vertical ribs *e² e³*, formed on the inner faces of the draft-irons. On the said draft-irons opposite the said draw-bar spring are located two horizontally-sliding abutment-plates G G, the ends of which form inwardly and outwardly facing shoulders adapted for contact with the ends of the follower-plates F' F², said sliding abutment-plates being generally similar to those shown in my prior patent, No. 690,684, of January 7, 1902. Said draft-irons E E have the form of recessed or flanged plates secured by mortises and bolts to the inner surfaces of the draft-sills A. Each of said plates E is provided with an upper horizontal longitudinal flange E² and with a lower horizontal longitudinal flange E³, the latter being formed by a separate horizontal bottom plate E⁴, removably secured to the

plates by bolts $c\ c$. Said horizontal flanges form, with the vertical ribs $e^2\ e^3$, recesses into which the ends of the several follower-plates project and within which the movable abutment-plates $D\ D'$ are inserted and adapted to slide. The lower flange or bottom plate E^3 serves to support the follower-plates in position and when detached enables said follower-plates to be readily dropped out of their places. To support and guide the abutment-plates, lugs E^5 are cast on the inner faces of the draft-irons and extend through horizontal slots g in the abutment-plates. So far as these details are concerned the device illustrated is like those shown in the prior patents hereinbefore referred to. The several follower-plates are straight or flat, and the plates $F\ F'$ or $F^2\ F^3$, constituting each set, are separated by metal spacing-blocks, each consisting of two parts, (indicated by $f\ f'\ f^2\ f^3$.) Said spacing-blocks are supported or held in place between the follower-plates by means of intermediate follower-plates $F^7\ F^8$, the plate F^7 being inserted and secured between the two parts $f\ f'$ of one of the spacing-blocks, and the plate F^8 being likewise inserted and secured between the parts $f^2\ f^3$ of the other spacing-block, so that the said plates $F^7\ F^8$ by engagement of their ends with the recesses of the draft-irons serve as a means of supporting or holding in place the spacing-blocks as a whole.

So far as the operation of the plates $F^7\ F^8$, supporting the two-part spacing-blocks, is concerned the parts constituting said spacing-blocks may be attached to said plates in any suitable or preferred manner. I have, however, shown in the accompanying drawings a special construction for this purpose, which is in itself novel, the same consisting in a plurality of studs f^4 , secured in one of the parts, as f or f^3 , passing through holes formed in the supporting-plates F^7 and F^8 and entering holes or sockets formed in the other part, as f' or f^2 , of the spacing-blocks. It is not necessary that the said studs should be secured in the holes or sockets which receive them, inasmuch as the pressure of the draw-bar springs always holds the parts together, and by so constructing the parts that the said studs fit loosely in the sockets the parts may be more readily assembled or taken apart.

As a further improvement upon the construction shown in said prior patents I place between the ends of the draw-bar springs and the follower-plates bearing-plates $H\ H'$, which are arranged to take the end thrust of the springs and transmit the same to the follower-plates. The said bearing-plates are provided with central studs or projections $h\ h'$, which enter the ends of the inner spiral spring D' and fit therein sufficiently close to hold said spring centrally in place. The said studs $h\ h'$ are, moreover, made of such length that they will come in contact with each other to limit

the compression of the draw-bar springs. The said studs are preferably made of such length that they will abut against each other just before the coils or convolutions of the spring are brought into contact with each other, thereby avoiding liability of breakage of the springs, which often occurs when the shock of coupling is so great as to bring the coils of the spring solidly into contact with each other. The plates $H\ H'$ are held from moving or shifting vertically by contact of their upper and lower edges with the upper and lower parts of the yoke C , said bearing-plates being provided for this purpose with horizontal top and bottom surfaces or edges, as clearly seen in Fig. 5. Said bearing-plates are also held from shifting sidewise or laterally by means of upwardly-projecting lugs $h^2\ h^2$ thereon, which lugs rise at either side of the upper member of the yoke in position for engagement of their outer edges with the inner edges of the top flanges of the draft-irons. By reason of the engagement of the said bearing-plates with the parts of the yoke and the flanges of the draft-irons, as described, said plates are held positively in position and in turn serve to support the studs $h\ h'$ and to hold in place the central or interior spiral spring D' . The exterior spring D is held or confined from movement at its top and bottom by the upper and lower parts of the yoke C , as clearly seen in Fig. 2, while sidewise movement thereof is prevented by means of vertically-arranged guide-plates I , located inside of the abutment-plates and secured to the inner ends of the studs E^5 , by which the sliding abutment-plates are held in place. Said guide-plates I are, as herein shown, attached to the inner ends of said studs or lugs by means of bolts i , which pass through the studs to the outer faces of the draft-irons, as clearly seen in Figs. 4 and 7.

The natural or normal position of the several parts is shown in Figs. 1 and 2, the follower-plates $F\ F'\ F^2\ F^3$ being held by the expansive action of the draw-bar springs, with their ends in contact with the shoulders $e\ e'$ on the draft-irons. At this time the ends of the abutment-plates are located a short distance from the two innermost sets $F'\ F^2$ of follower-plates. The parts being in this position, when the draw-bar is forced toward the center of the car the ends of the innermost follower-plates of the set at the outer end of the draw-bar spring will come in contact with the adjacent end of the abutment-plates $G\ G$, with the result of forcing or moving said abutment-plates endwise and bringing them into contact with the follower-plate F^2 at the opposite or inner end of the draw-bar spring. Thereafter both sets of plates $F'\ F^2$ will be bent or flexed until their ends are brought into contact with the exterior plates $F\ F^3$. As the abutment-plates are thus moved, the inward movement of the draw-bar will be resisted not only by the draw-bar

spring D D', but also by the resistance afforded by the bending of said follower-plates F F². After the last-mentioned follower-plates have been flexed sufficiently to bring them into contact with the exterior plates F F³ then further inward movement of the draw-bar will be resisted by all of the follower-plates working together; or, in other words, if the pressure of the draw-bar due to the shock of coupling is greater than will be absorbed by the interior plates F' F² the exterior plates F F³ will take part of the pressure by reason of the contact therewith of the ends of said innermost plates F' F². In the outward movement of the draw-bar, such as occurs when the train is starting or under similar conditions, the movement described will be reversed, the yoke in such case acting on the inner ends of the draw-bar spring and tending to force the plates F against the shoulders e and the plates F² against the ends of the sliding abutment-plates. In both cases the action of the draw-bar spring and the follower-plates will afford a graduated cushioned resistance to the shocks coming on the draw-bar, as set forth in the prior patents hereinbefore referred to.

The exterior follower-plates F F³ will preferably be made stiffer than the others, because they act to take the ultimate strain or to finally limit the movement of the draw-bar. For this purpose the said exterior plates are shown as made of four thicknesses or layers; but, if desired or preferred, thicker plates or a single thick plate may be substituted for the said plates F F³. The interior plates F' F² are shown as consisting each of three plates; but a greater or less number may of course be used in accordance to the conditions in any particular case.

The studs h h' upon the guide-plates H H' being, as before stated, arranged to come in contact with each other when the draw-bar springs have been compressed to the maximum extent found desirable or practicable, said studs take the entire end thrust of the draw-bar after the draw-bar springs have been so compressed and serve to transmit the said end thrust to the set of exterior plates F or F³ toward which the draw-bar is moving. The ultimate or maximum pressure coming on the draw-bar in coupling the cars or under other circumstances is, therefore, taken entirely by the several follower-plates which are in action at that time, and the spiral springs are relieved of shocks or strains which might result in breaking the same.

As a further improvement I make the inner end of the draw-bar B, which bears against the follower-plates F, with a narrow vertical bearing-surface, preferably not wider than the spacing-block placed between the said set of springs, and I similarly provide on the inner end of said yoke a bearing-block J, the contact-face of which is likewise narrow and vertical. With this construction the ends of

the spring follower-plates are left free to be bent or flexed throughout a considerable portion of the length of the same, thereby giving greater elasticity to the plates and enabling them to afford a greater degree of spring resistance to the movement of the draw-bar after the spiral spring has been compressed and the pressure of the draw-bar is taken by the studs h h'.

As a further improvement the removable bottom plates E³ of the draft-irons are extended inwardly or made so wide that their inner edges are brought nearly into contact with the side edges of the lower member of the yoke. By this construction the said plates E³ are adapted to form lateral guides for the yoke, adapted to hold the yoke from sidewise movement under lateral strains coming on the draw-bar, and thereby hold the draw-bar and yoke always in their central position. The said bottom plates E³ may be adapted to withstand the lateral strains brought thereon by the contact of the yoke therewith by being arranged to abut or bear laterally outward at the end portions of their outer edges against the lower margin of the draft-irons, as clearly shown in Fig. 3, the said plates being arranged and attached to the draft-irons in the manner shown in my allowed application, Serial No. 76,853, filed September 28, 1901. As illustrated in that application, the lower removable plate has bearing at its ends, as well as at its side face, against bearing surfaces or shoulders on the draft-iron, so that both endwise and lateral strains or pressure brought on the said plate is transmitted directly to the draft-iron and does not come on the vertical bolts which hold it in place. The bottom plates E³ are shown in Figs. 2 and 3 as arranged and attached in the same manner as are the like plates shown in said application, so as to relieve the bolts e⁴ e⁴ from the strains due to the contact of the yoke therewith. As in the like construction shown in said application, the plates E³ will at their middle parts be cut away at their edges adjacent to the draft-irons to form slots g² to receive depending flanges g' on the lower edges of the abutment-plates G, as also shown in Fig. 3, said flanges serving to confine in place the lower parts of the said abutment-plates, as fully set forth in said prior application.

I claim as my invention—

1. The combination with a shouldered draft-sill, of a draw-bar, a draw-bar spring, spring follower-plates interposed between the ends of the draw-bar spring and the draw-bar, spacing-blocks separating the follower-plates at each end of the spring, said spacing-blocks consisting each of two parts, and follower-plates interposed between the parts of the spacing-blocks and connected with the same to support them in operative position.

2. The combination with shouldered draft-sills, of a draw-bar, a draw-bar spring, spring follower-plates interposed between the ends

of the draw-bar spring and the draw-bar, spacing-blocks separating the follower-plates at each end of the spring, said spacing-blocks consisting each of two parts or sections, and
 5 follower-plates interposed between said parts or sections for supporting the spacing-blocks, said supporting follower-plate being provided with holes, and the parts of spacing-blocks with lugs and sockets, said lugs being adapted
 10 to pass through the holes in the supporting follower-plate.

3. The combination with shouldered draft-sills, of a draw-bar, a draw-bar spring, spring
 15 follower-plates interposed between the ends of said draw-bar spring and the draw-bar, and bearing-plates interposed between the ends of said spring and the follower-plates, and which are provided with rigidly-attached
 20 studs which project toward each other and are adapted for contact to limit the compression of said spring, said bearing-plates being unattached to the follower-plates and having bearing-contact at their edges with the yoke.

4. The combination with shouldered draft-sills, of a draw-bar provided with a yoke, a
 25 draw-bar spring, spring follower-plates interposed between the ends of the draw-bar spring and the draw-bar and its yoke, and bearing-plates interposed between the ends of the
 30 spring and the said follower-plates, said bearing-plates being engaged at their upper and lower edges with the yoke, and being provided with rigidly-attached studs which enter the
 35 ends of the said spring and which are adapted for contact with each other to limit the compression of the spring.

5. The combination with shouldered draft-sills, of a draw-bar, a coiled draw-bar spring, spring follower-plates interposed between the
 40 ends of said draw-bar spring and the draw-bar and bearing-plates interposed between the ends of the spring and the said follower-plates, said bearing-plates being provided with inwardly-extending rigidly-attached
 45 studs which enter the ends of the spring and are adapted for contact with each other to limit the compression of the spring and also with lateral bearing-surfaces adapted for sliding
 50 engagement with parallel bearing-surfaces on the draft-sills to hold the said plates from lateral movement.

6. The combination with shouldered draft-sills, of a draw-bar having a yoke, a draw-bar spring, spring follower-plates interposed
 55 between the ends of said draw-bar spring and the draw-bar and its yoke, and bearing-plates interposed between the ends of the spring and the said follower-plates, said bearing-plates being provided with inwardly-projecting
 60 rigidly-attached studs which enter the ends of the spring and are adapted for contact with each other to limit the compression of the spring, said bearing-plates being adapted to bear at their upper and lower edges
 65 against the upper and lower parts of the draw-bar yoke, and having lateral bearing-surfaces adapted to engage parallel bearing-surfaces

on the draft-sills to hold the plates from lateral movement.

7. The combination with draft-sills, of recessed draft-irons provided with inwardly-extending, longitudinal top flanges, a draw-bar having a yoke, a coiled draw-bar spring, spring follower-plates interposed between the
 7 ends of said spring and the draw-bar and its yoke, and bearing-plates interposed between the ends of the spring and the follower-plates, said bearing-plates being provided with rigidly-attached studs which enter the ends of
 8 the draw-bar spring and are adapted for contact with each other to limit the compression of the spring, said bearing-plates being adapted to bear at their upper and lower edges against the upper and lower parts of the
 8 draw-bar yoke, and having at their upper edges lugs which extend upwardly at the sides of the yoke and are adapted for sliding engagement with the longitudinal flanges on the draft-irons.

8. The combination with draft-irons, a
 9 draw-bar, a draw-bar spring, spring follower-plates interposed between the draw-bar spring and the draw-bar, slotted abutment-plates mounted to slide on the draft-irons, lugs on
 9 the draft-irons which pass through the slots in said abutment-plates, and guide-plates for the spring secured to said lugs inside of the abutment-plates.

9. The combination with shouldered draft-sills, of a draw-bar, a draw-bar spring, spring
 10 follower-plates interposed between the inner ends of said draw-bar and the draw-bar spring, and spacing-blocks separating the said follower-plates, the inner end of the draw-bar being provided with a narrow, vertically-extending
 10 surface for contact with the exterior follower-plate.

10. The combination with shouldered draft-sills, of a draw-bar, and draw-bar yoke, a
 11 draw-bar spring, spring follower-plates interposed between the ends of said draw-bar spring and the draw-bar yoke; the inner end of the draw-bar and the end portion of the yoke being provided with central, vertical
 11 bearing-surfaces made narrower than the draw-bar and yoke for contact with the exterior follower-plates.

11. The combination with shouldered draft-sills, of a draw-bar and yoke, a draw-bar
 12 spring, spring follower-plates, sliding abutment-plates mounted on the sills between the ends of the follower-plates, and bearing-plates interposed between the ends of the spring, and the follower-plates, and provided with
 12 inwardly-extending rigidly-attached studs adapted for contact to limit the compression of the springs, said bearing-plates being unattached to the follower-plates and having
 13 bearing engagement at their edges with the yoke and with parallel bearing-surfaces on the draft-sills.

12. The combination with shouldered draft-sills, of a draw-bar and yoke, a draw-bar
 spring, two sets of spring follower-plates lo-

cated one set at each end of the spring, a
spacing-block between the follower-plates of
each set, movable abutment-plates adapted
to act on the innermost plates of the two sets
5 of follower-plates, and bearing-plates inter-
posed between the ends of the spring and
said innermost follower-plates, and provided
with rigidly-attached studs which act to limit
the compression of said spring, said bearing-
10 plates being unattached to the follower-plates
and having bearing engagement at their edges

with the yoke and with parallel bearing-sur-
faces on the draft-sills.

In testimony that I claim the foregoing as
my invention I affix my signature, in pres- 15
ence of two witnesses, this 21st day of Janu-
ary, A. D. 1902.

JAMES MILTON WAUGH.

Witnesses:

C. CLARENCE POOLE,
WILLIAM L. HALL.