No. 684,245. Patented Oct. 8, 1901.

J. A. HINSON.

DRAW BAR DRAFT RIGGING FOR CAR COUPLINGS.

(Application filed May 17, 1901.)

(No Model.) 3 Sheets—Sheet 1.

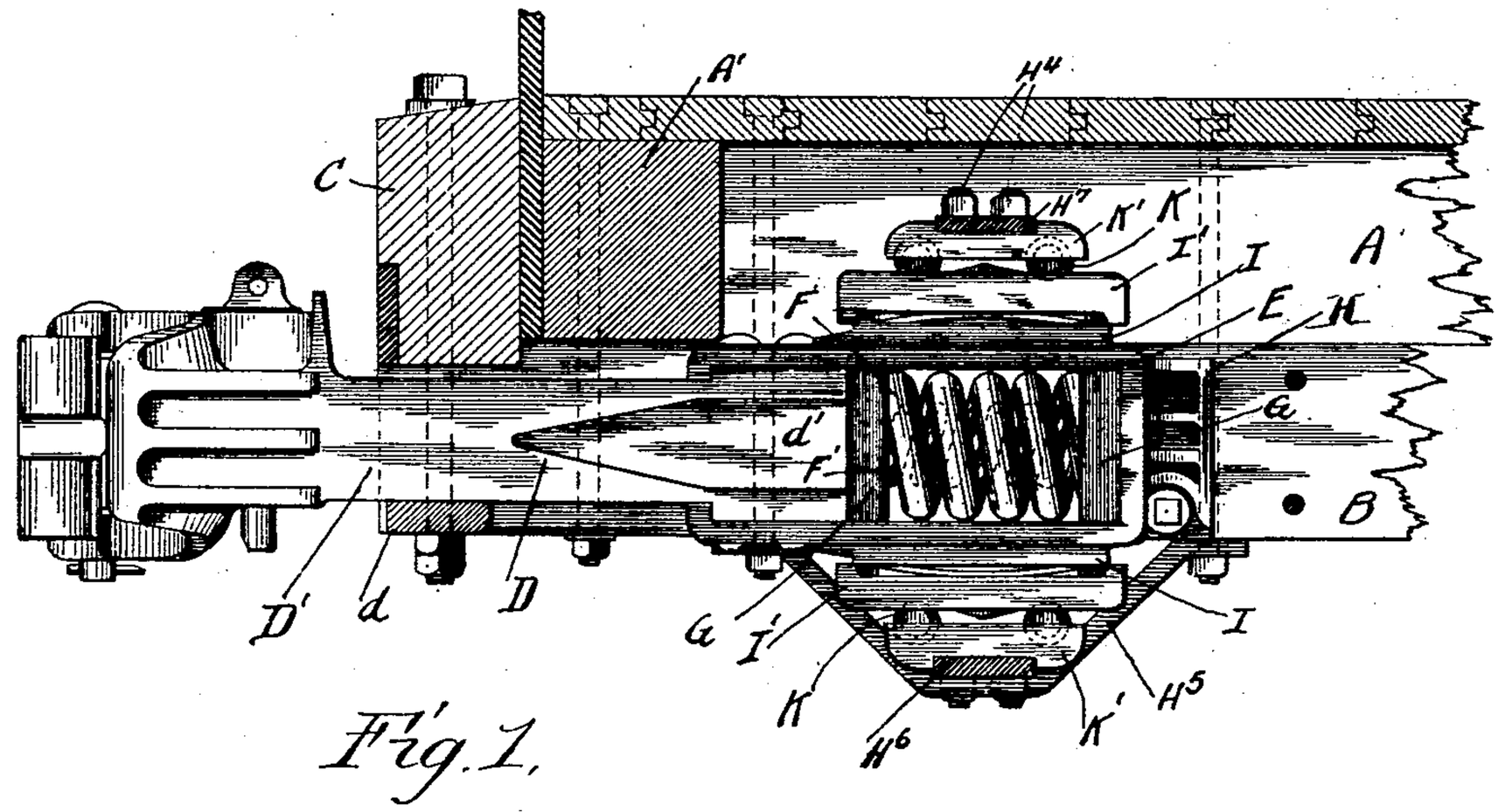

Fig. 1.

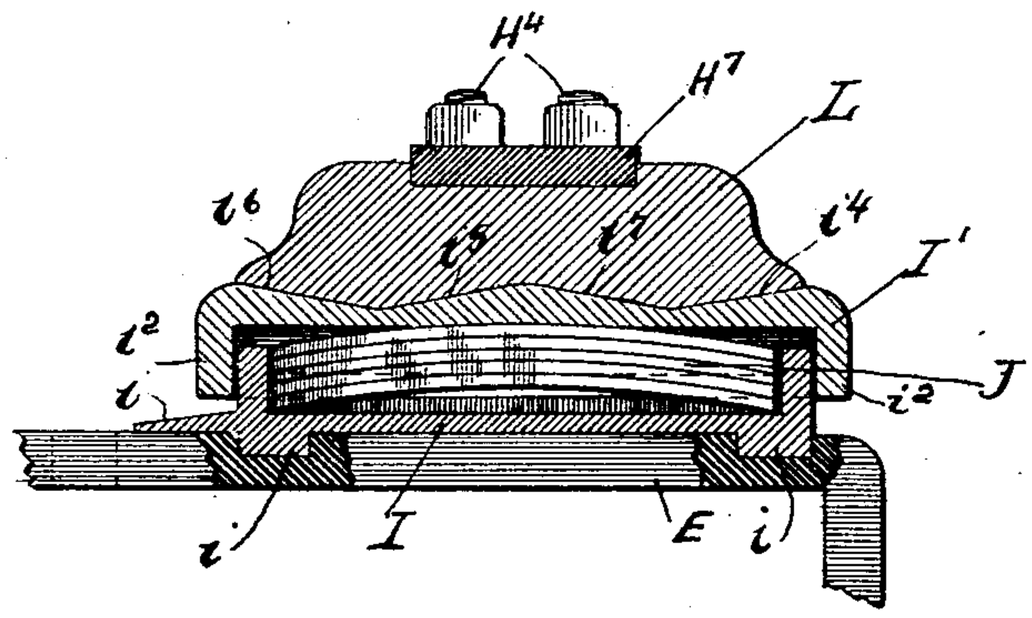

Fig. 6.

Witnesses:
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C. H. Crawford

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(No Model.) 3 Sheets—Sheet 2.

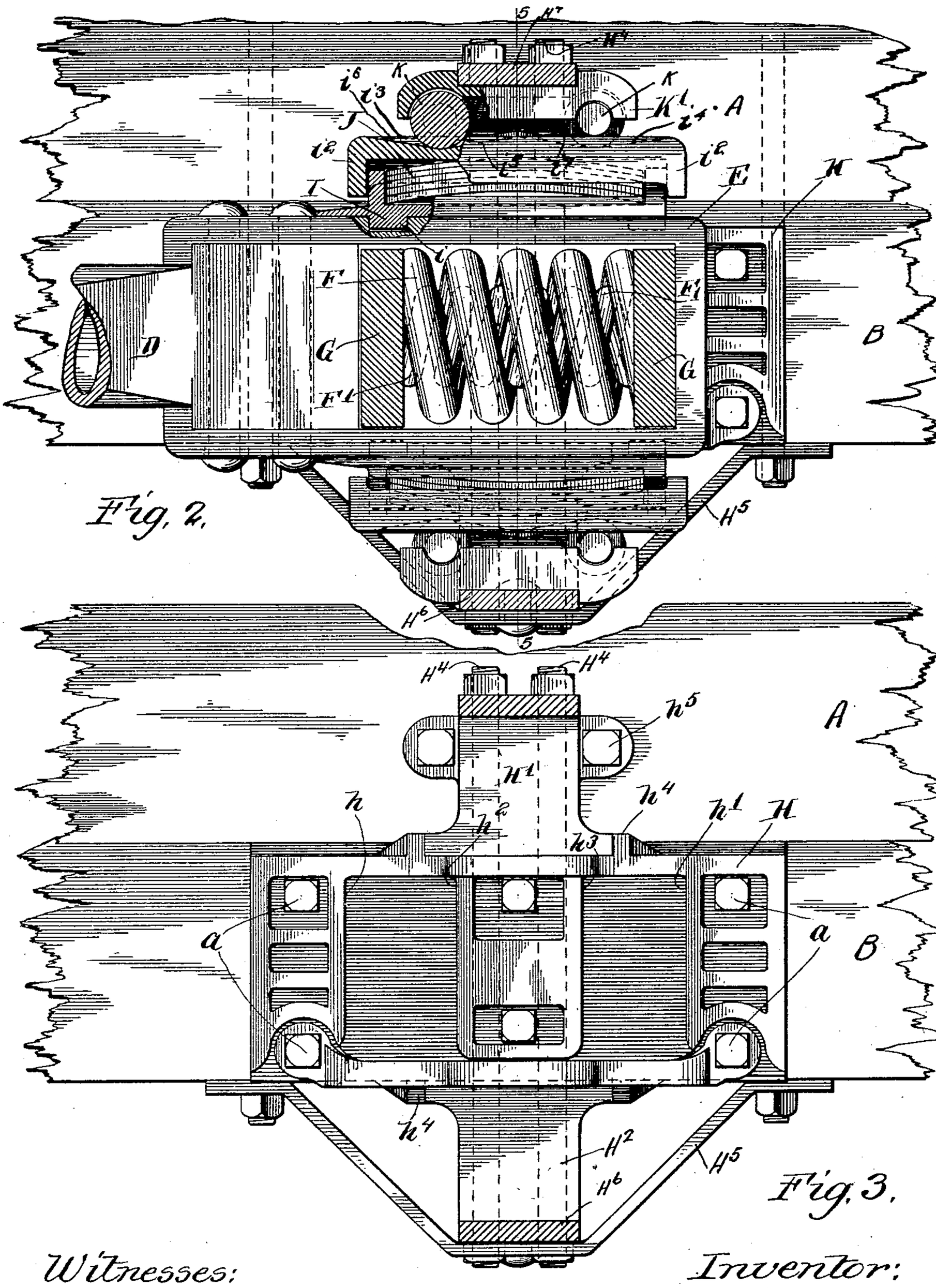

Fig. 2.

Fig. 3.

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(No Model.) 3 Sheets—Sheet 3.

Fig. 4

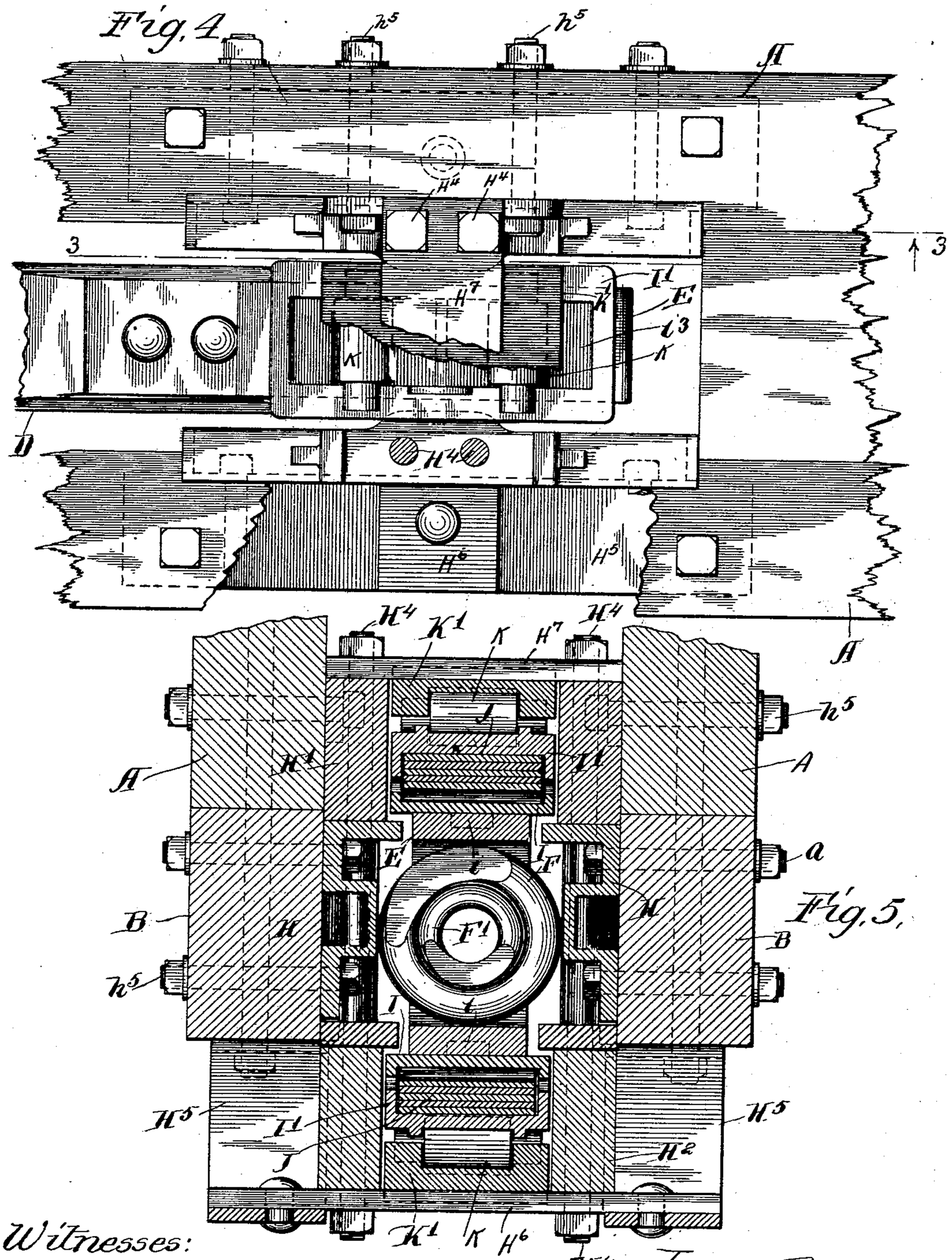

Fig. 5.

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UNITED STATES PATENT OFFICE.

JAMES A. HINSON, OF CHICAGO, ILLINOIS.

DRAW-BAR DRAFT-RIGGING FOR CAR-COUPLINGS.

SPECIFICATION forming part of Letters Patent No. 684,245, dated October 8, 1901.

Application filed May 17, 1901. Serial No. 60,668. (No model.)

To all whom it may concern:

Be it known that I, JAMES A. HINSON, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Draw-Bar Draft-Rigging for Car-Couplers; 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 draw-bar draft-rigging for car-couplers, and refers more specifically to devices for taking the shock between the draw-bar and draft-sills in operation of couplings and in general usage and also preventing recoil of the parts under the action of the spring or springs placed under tension.

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

In the drawings, Figure 1 is a side elevation of one form of draft-rigging, showing my improvements applied thereto and showing, also in side elevation, a coupler draw-bar, one of the draft-sills, and the front end of one of the car-sills and in cross-section the buffer and end sills of the cars. Fig. 2 is an enlarged view of the parts shown in Fig. 1, partly in side elevation and partly in longitudinal section. Fig. 3 is a vertical section on line 3 3 of Fig. 4 looking in the direction indicated by the arrow. Fig. 4 is a plan view of the principal parts shown in Fig. 1 with some of the parts broken away to show the subjacent construction. Fig. 5 is a transverse vertical section on line 5 5 of Fig. 2. Fig. 6 illustrates a modification of the invention.

As shown in the drawings, A A designate the forward ends of longitudinal car-floor sills; A′, a transverse end sill of the car-floor frame; B B, draft-sills, and C the buffer-sill.

D designates the draw-bar of the coupler, which is located centrally between the draft-sills B. The outer end or draw-head D′ is supported below the buffer-sill by a stirrup in the usual manner. To the inner end of said draw-bar is attached a yoke E, said yoke being herein shown as formed of a single piece of metal bent between its ends and which ends overlap and are secured to an enlargement d' at the inner end of the draw-bar.

F F′ designate two coiled spiral springs, which are located between the arms of said yoke and are held from vertical displacement by said arms. Said springs bear at their ends against follower-plates G, located at the forward and rearward ends of the yoke. Said follower-plates are adapted to engage at their ends forwardly and rearwardly facing shoulders h, h', h^2, and h^3, formed on draft-plates H, which are secured to the inner faces of the draft-sills B, as shown in Fig. 5. Said follower-plates normally engage the shoulders $h\ h'$ at the ends of the draft-plates when the springs are expanded; but either of the follower-plates may be moved into contact with one of the intermediate shoulders $h^2\ h^3$ when the springs are placed under compression by movement of the draw-bar and yoke either forwardly or rearwardly past the central position thereof.

The construction thus far described may have the form of any of the well-known patterns of draft-rigging of this general type and constitutes no part of the present invention.

The improvements which constitute my present invention consist of an auxiliary spring or springs adapted to be placed under compression conjointly with the springs F F′ and whose direction of compression is transverse to that of the springs F F′. Said auxiliary springs are so located as to be placed under compression when the draw-bar is moved either forwardly or rearwardly from its position of rest. Stationary and movable coacting parts are provided, the latter movable with the draw-bar, which produce compression of the auxiliary springs upon movement of the draw-bar. Preferably two sets of said auxiliary springs are employed, one above and one below the yoke E, and the combined strengths of said springs are made greater than that of the springs F F′. The coacting movable and stationary parts which produce upon movement of the draw-bar compression of the auxiliary springs are so made as to prevent recoil of the parts when the compressive strain is released from the springs, and thereby obviates the jars and shocks due to such recoils.

Referring now to the details of the improvements constituting my invention in connection with the accompanying drawings, I I designate upwardly and downwardly opening spring-boxes attached to the upper and lower faces, respectively, of the upper and lower yoke-arms. Said boxes are provided with lugs *i*, which set into notches or recesses formed in the outer faces of the yoke-arms and which prevent lateral movement of said boxes. Contained within each of said boxes is a set of springs J, consisting each of a plurality of curved leaves, the convex sides of which are directed outwardly. Fitted over the open sides of said boxes are caps I′, having inwardly-extending end flanges i^2, which overlap the walls of the boxes. Said caps have contact at their central portions with the outer convex faces of the outermost springs of the two sets and are normally spaced a distance from the outer margins of the boxes, as shown in Fig. 2, to permit the caps to move inwardly when pressure is applied to the boxes to compress said springs. The outer faces of said caps are each provided with a groove or race i^3, Figs. 2 and 4, and in said grooves or races travel rollers K, which have bearing in stationary horizontal blocks K′, located above and below the sets of rollers. Said blocks are provided with inwardly-facing recesses to receive the rollers and outside said recesses with inwardly-facing semicylindic bearing-recesses which engage the reduced bearing ends of said rollers. Said blocks K are held stationary with respect to the car-sills by the following construction:

H′ H², Figs. 3 and 5, designate upwardly and downwardly extending arms attached to or formed on the upper and lower margins, respectively, of the draft-plates H. As herein shown, said arms are made separate from said plates and are held from lateral displacement thereon by means of lugs h^4 on said plates, which enter sockets or recesses in the flanged bases of the arms. The upper arms H′ are attached to the sills A by means of bolts h^5, which pass horizontally through said sills and through lugs on said arms. The upper and lower arms and the draft-plates are held rigidly together by vertical binding-bolts H⁴, which pass longitudinally through said arms and transversely through the draft-plates, as shown in Fig. 5. The lower arms are held laterally in place by means of brace-straps H⁵, one at each side, which are attached at their ends to the draft-sills by bolts or rivets and at their lowermost central portions, by means of rivets or bolts, to a transverse bar H⁶, extending across the ends of said lower arms and through which the bolts H⁴ pass, as clearly shown in Figs. 3 and 5. H⁷ designates a transverse bar which extends between and across the upper ends of the upper arms H′ and is secured to said arms by the bolts H⁴, which pass through said bars. Said bars H⁷ H⁶ pass above and below, respectively, the upper and lower bearing roller-blocks K′ and fit in upwardly and downwardly opening transverse notches in said blocks, as clearly shown in Fig. 2. The blocks are thus held rigidly from spreading apart when vertical stress is applied thereto.

The bottoms of the grooves or races i^3 in the spring-box caps are each provided with two depressions located between the ends and the longitudinal center of the grooves and in which depressions the rollers K rest when the yoke E is in its central position or position of rest. Said bottoms of the grooves or races incline from the lowest parts of said depressions in opposite directions or toward the center and ends of the caps and form in the bottom of each groove two forwardly-facing inclined surfaces i^4 i^5 and two rearwardly-inclined surfaces i^6 i^7, as shown in Figs. 2 and 6.

From the foregoing it will be observed that the spring-boxes, the springs, and the caps move backwardly and forwardly with the yoke, while the rollers and blocks K′ are held stationary by the cross-bars H⁶ H⁷, connected with the arms H′ H² of the draft-plates H, said latter parts constituting, in effect, a rigid frame, through which the draw-bar and parts movable therewith extend. It will also be observed that the spring-boxes, springs, and caps are held in their proper positions relatively to the yoke and the rollers and their bearing-blocks in proper position relatively to the spring-boxes and caps by the connection of the bars H⁶ H⁷ with the bearing-blocks, the tension of the springs maintaining the parts in their proper coöperative positions.

The action of the device is as follows: As before stated, when the draw-bar is in its position of rest the rollers K occupy the depressed parts of the grooves or races i^3 in the spring-box caps. At this time the springs J are under only sufficient tension to hold the parts in their proper positions, and the caps of the spring-boxes are out of contact with the boxes. When the draw-bar is forced rearwardly by pressure due to a shock transmitted thereto by the operation of coupling, it acts through the front follower-plate to compress the spiral springs F F′. The rearward movement of said yoke also carries with it the spring-boxes, springs, and caps for the boxes, and the rearwardly-facing inclined parts i^6 i^7 of the bottoms of the races or grooves in said spring-box caps are forced against the rollers K. As said rollers are vertically immovable, the movement of said rearwardly-facing inclined parts of the races or grooves thereagainst causes the caps to be depressed toward and to thereby compress the springs J, which latter are consequently compressed conjointly with the compression of the springs F F′. As said draw-bar and yoke and the parts carried thereby continue to move the auxiliary springs are brought gradually under greater compression, and the resistance to such compression gradually

increases, thereby gradually absorbing the stress or shock transmitted thereto. When the auxiliary springs are placed under tension, considerable friction is produced between the bearing-surfaces of the rollers K and the blocks K′, which prevents the sudden return of the movable parts in a manner to produce severe shocks or jars; but, on the other hand, such return of the parts will be comparatively gradual. Moreover, by reason of the fact that the rollers K when the draw-bar is returned to its central position of rest occupies the lowest parts of the depressions in the spring-box caps and that the further movement of said rollers after such return causes said rollers to encounter inclined parts of said caps any considerable recoil of said parts past their central positions is prevented. It will be obvious that a sudden outward pull of the draw-bar, such as arises when the middle of a train passes over a grade or when the train is suddenly started, will be gradually taken up and communicated to the car in a similar manner, the inclined spring-box caps passing under the rollers in a direction the reverse of that described. The resistance exerted by both sets of springs J is of course double the resistance of one set. In practice the strength of the springs J will greatly exceed the strength of the springs F F′. For instance, if the last-mentioned springs have a resistance of twenty thousand pounds each set of springs J will desirably exert a resistance of fifty thousand pounds or more, whereby the combined resistance of said springs J equals about five times that of the springs F F′.

In Fig. 6 I have shown a modification of the parts which coact to produce compression of the springs J. In this construction the spring-box caps are depressed by frictional engagement of horizontal blocks L, which are provided in their inner faces with inclined surfaces which correspond with and engage the inclined outer surfaces i^4, i^5, i^6, and i^7 of the spring-box caps I′. In this construction when the draw-bar is moved past its central position in either direction the inclined surfaces of the bars L ride upon the inclined surfaces of the caps and move said caps inwardly, and thereby compress the auxiliary springs in the same manner as do the parts of the construction hereinbefore described. It is obvious that the same effects on the auxiliary springs will be produced if the positions of the coacting parts—to wit, the inclined parts and rollers, if the rollers be used—be reversed, or, in other words, if the rollers be mounted upon and movable with the draw-bar and the coacting inclined surfaces be formed on a part stationary with the blocks K′ or like part. It is further obvious that the location of the springs on parts stationary with the draft-sills and the location of the coacting parts, such as the rollers, on the yoke of the draw-bar will produce the same general results. The arrangement herein shown, however, is a preferable one, for the reason that the construction is very compact and great strength, with a minimum amount of material, is secured.

While the auxiliary springs illustrated have the form of curved plates, yet manifestly the same general results will be secured in the use of springs of other form arranged to be compressed in a direction transverse to the direction of movement of the draw-bar. The use of curved plates or leaf-springs is preferred, because affording compactness of construction and by reason of their strength, simplicity, and cheapness.

I claim as my invention—

1. A draft-rigging for cars comprising draft-sills, a draw-bar, a draw-bar spring, a second spring which is compressible in a direction transverse to the direction of compression of the first spring, and coacting parts on the draw-bar, and on the draft-sills producing compression of said second spring through longitudinal movement of said draw-bar, consisting of a roller on one part and an inclined surface on the other part.

2. A draft-rigging for cars comprising draft-sills, a draw-bar, a coiled draw-bar spring, two sets of leaf-springs located at opposite sides of the draw-bar and generally parallel therewith, a frame on the draft-sills through which the draw-bar reciprocates and coacting parts on said draw-bar and frame, embracing inclined surfaces on one of said parts and rollers on the other of said parts for producing compression of said leaf-springs in a direction transverse to the direction of movement of the draw-bar, through movement of said draw-bar.

3. A draft-rigging for cars comprising draft-sills, a draw-bar, a draw-bar spring, two sets of leaf-springs located at opposite sides of the draw-bar and generally parallel therewith, two spring-boxes in which said leaf-springs are contained, caps for said boxes bearing against the crowns of said springs, and a frame on the draft-sills through which the bar reciprocates, said spring-box caps being provided with inclined surfaces which coact with parts of the device to produce compression of the leaf-springs through longitudinal movement of the draw-bar.

4. A draft-rigging for cars comprising draft-sills, a draw-bar, a draw-bar spring, a leaf-spring generally parallel with the draw-bar and movable with the draw-bar, and a part on the draft-sills acting on said leaf-spring through movement of the draw-bar to compress the same.

5. A draft-rigging for cars comprising draft-sills, a draw-bar, a draw-bar spring, a spring-box movable with the draw-bar, a leaf-spring in said box, a cap for said box having one or more inclined faces, and a part on the draft-sills adapted to engage said inclined faces through movement of said bar to compress said leaf-spring.

6. A draft-rigging for cars comprising draft-sills, draft-plates attached thereto, a draw-

bar between said draft-plates, having at its rear end a yoke, follower-plates passing through said yokes and engaging at their ends said shoulders on said draft-plates, two sets of leaf-springs, one at each side of the draw-bar and movable therewith, rigid arms extending above and below the draft-plates, cross-bars extending between said arms, and blocks connected with said bars having parts which coact with parts attached to the leaf-springs to compress said springs.

7. A draft-rigging for cars comprising draft-sills, draft-plates attached thereto, a draw-bar between said draft-plates having at its rear end a yoke, follower-plates passing through said yokes and engaging at their ends said shoulders on said draft-plates, two sets of leaf-springs, one at each side of the draw-bar, and movable therewith, rigid arms extending above and below the draft-plates, cross-bars extending between said arms, and blocks rigid with said bars having bearing-rollers which engage inclined surfaces on movable plates which have contact with said leaf-springs.

8. A draft-rigging for cars comprising draft-sills, a draw-bar, a draw-bar spring, a second spring which is compressible in a direction transverse to the direction of compression of the first spring, and coacting parts on the draw-bar and on the draft-sills, one of which embraces a double-inclined surface and the other of which embraces a roller adapted to engage said double-inclined surface.

9. A draft-rigging for cars comprising draft-sills, a draw-bar, a draw-bar spring, spring-boxes provided with lugs which enter notches in the opposite faces of the draw-bar yoke, leaf-springs in said boxes, caps for said boxes each having one or more inclined faces, rigid arms extending on opposite sides of the draft-sills, cross-bars extending between said arms, and blocks having outwardly-opening recesses which engage said cross-bars, said blocks having parts which coact with the inclined surfaces of the spring-box caps to compress said springs through longitudinal movement of the draw-bar.

In testimony that I claim the foregoing as my invention I affix my signature, in presence of two witnesses, this 15th day of May, A. D. 1901.

JAMES A. HINSON.

Witnesses:
WILLIAM L. HALL,
GERTRUDE BRYCE.