R. D. GALLAGHER, Jr.

CAR CONSTRUCTION.

APPLICATION FILED MAY 21, 1909.

961,949.

Patented June 21, 1910.

5 SHEETS—SHEET 1.

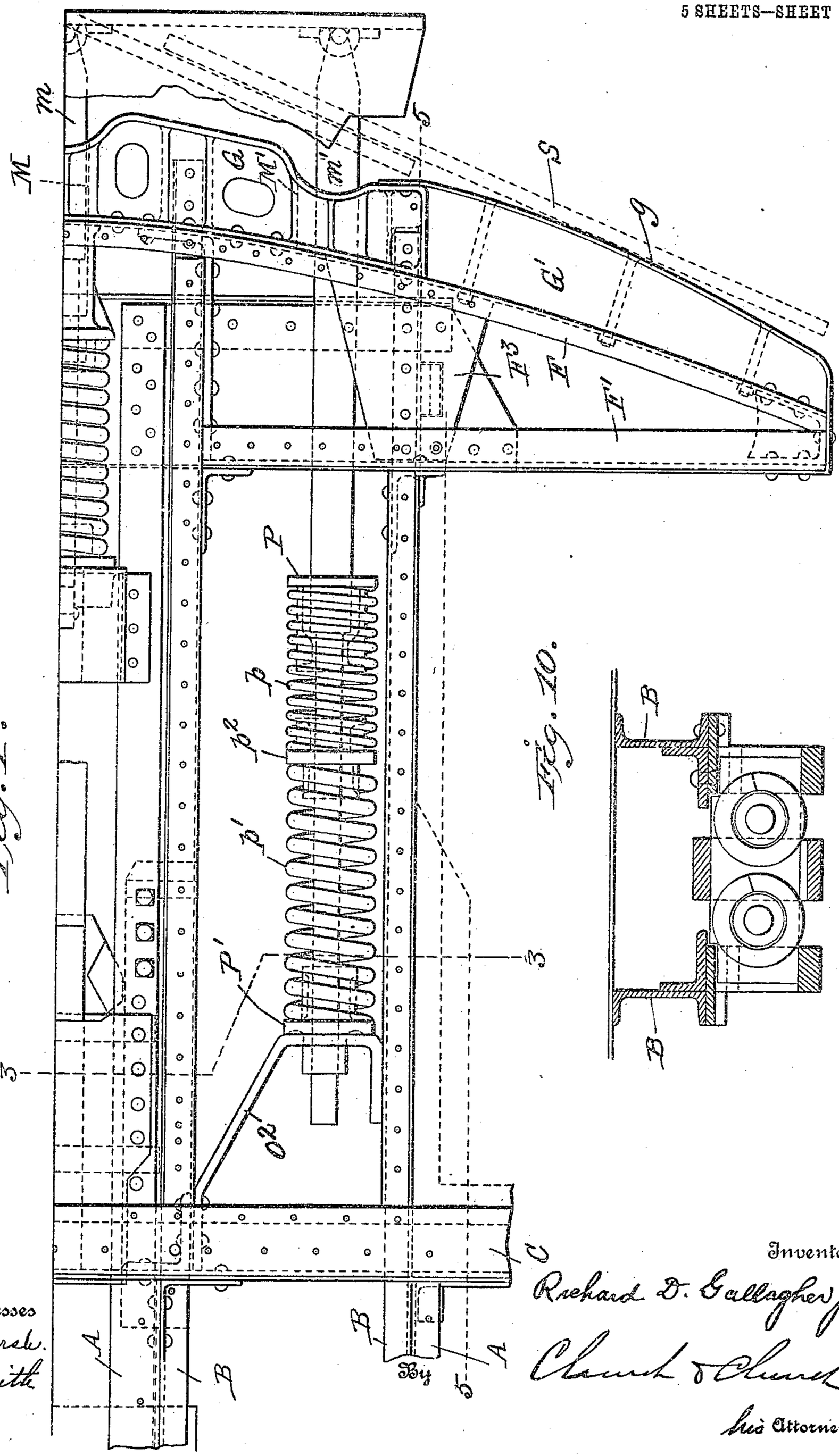

Fig. 1.

Fig. 10.

Witnesses

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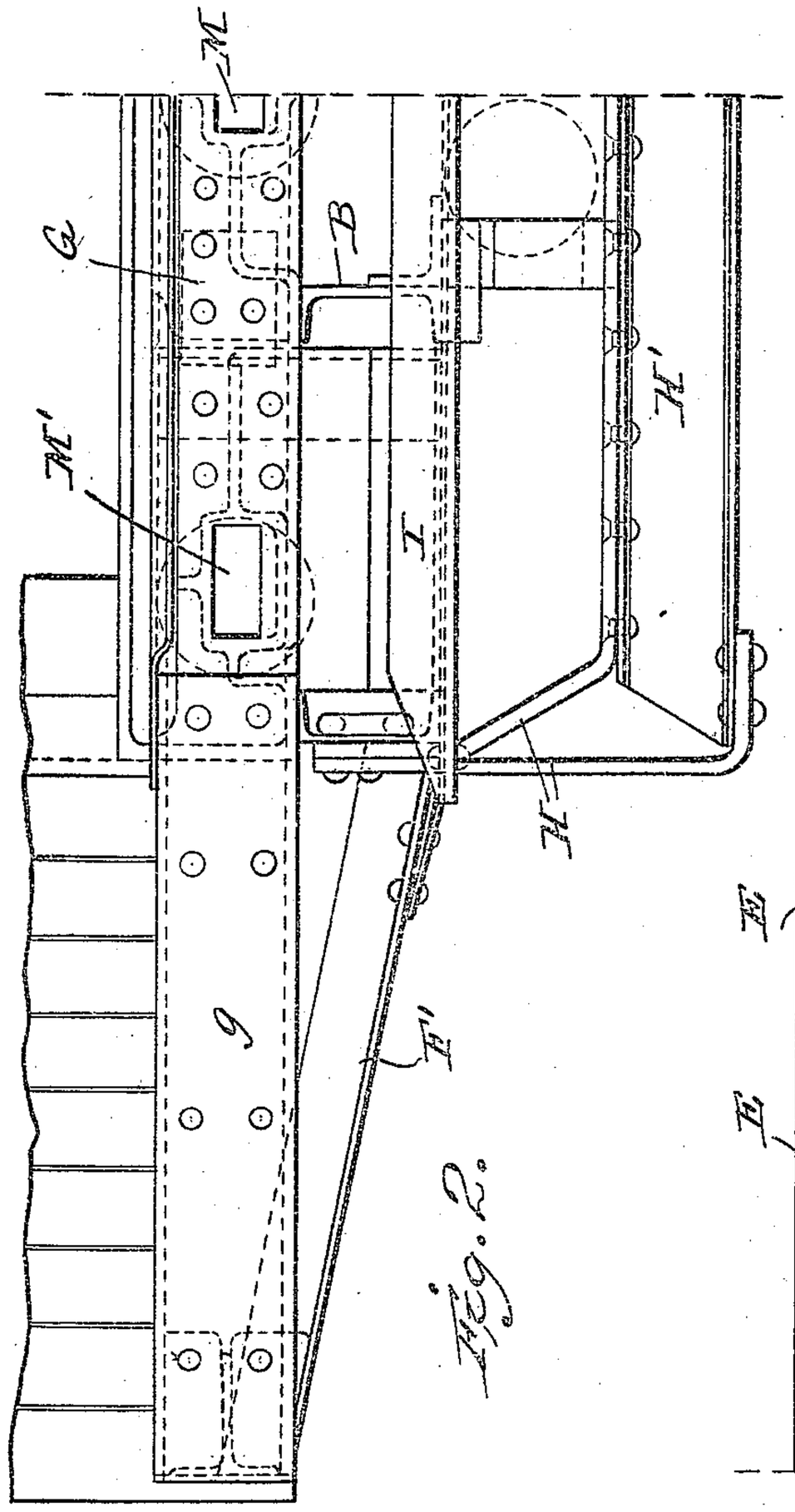

Fig. 2.

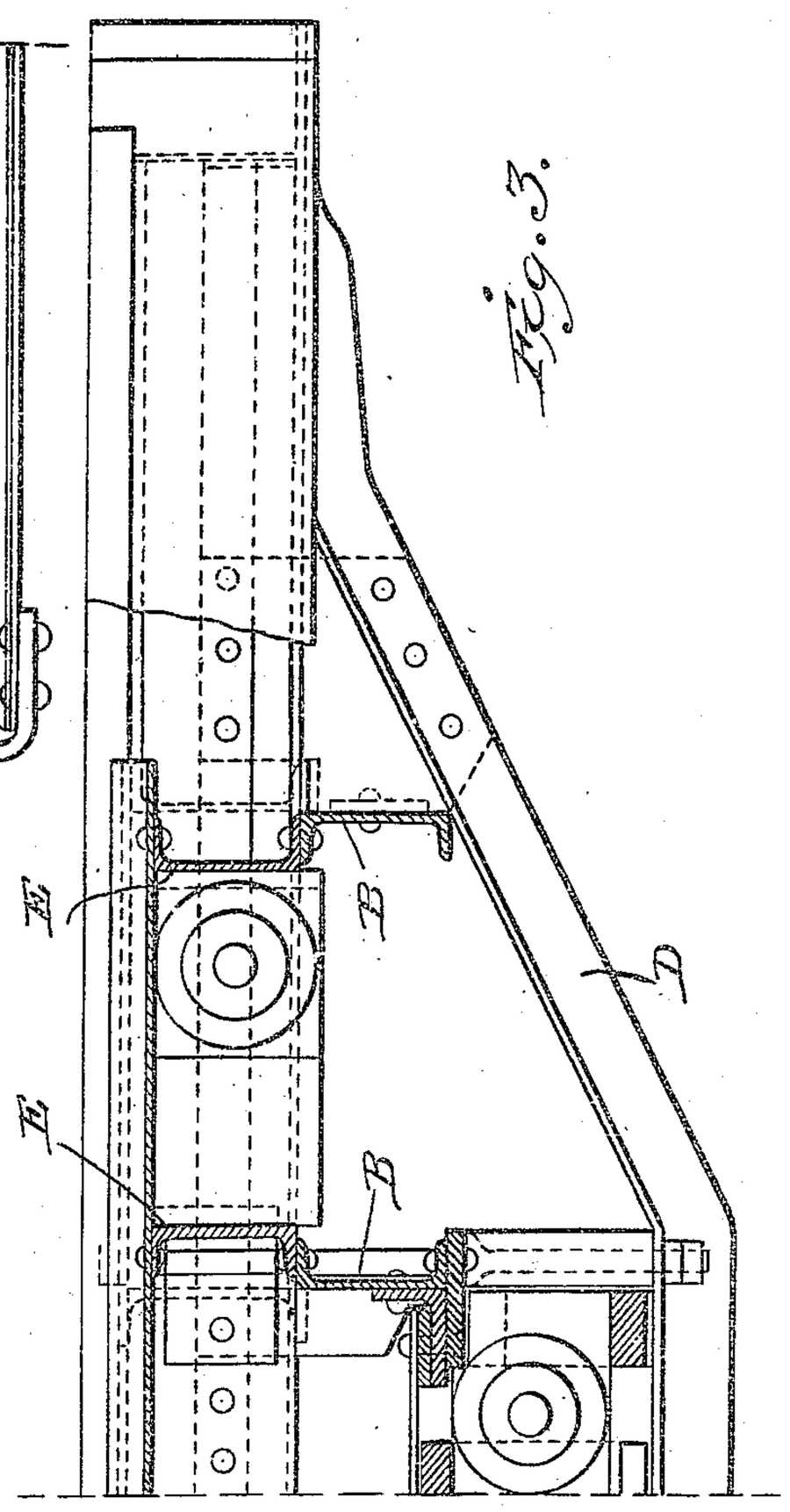

Fig. 3.

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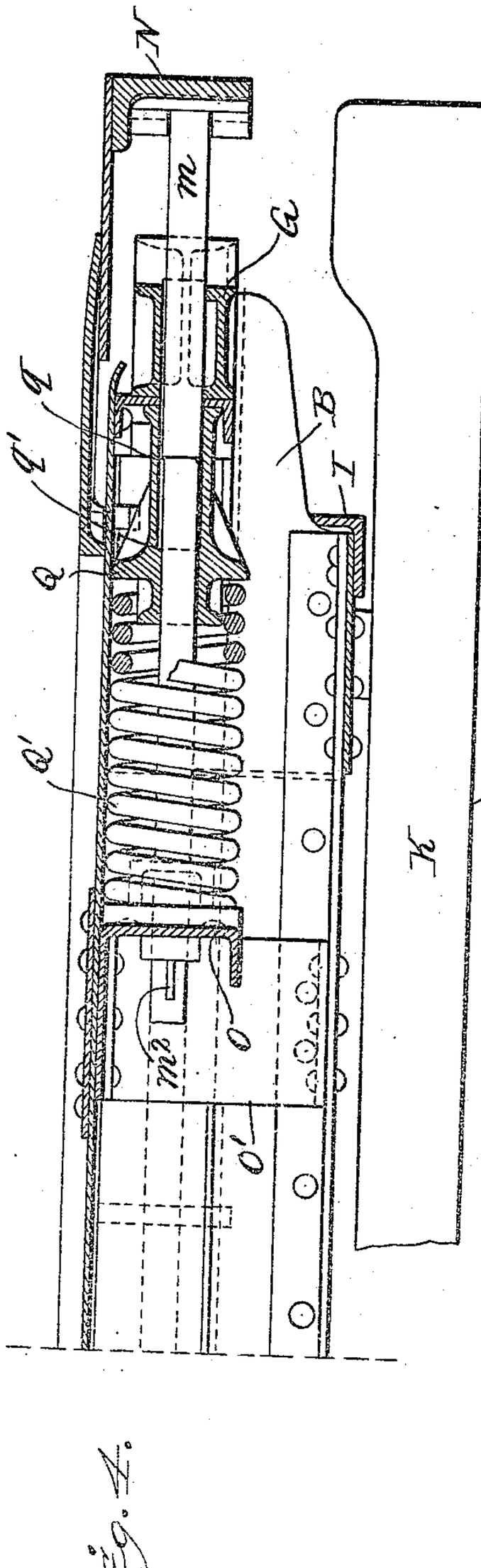
5 SHEETS—SHEET 3.



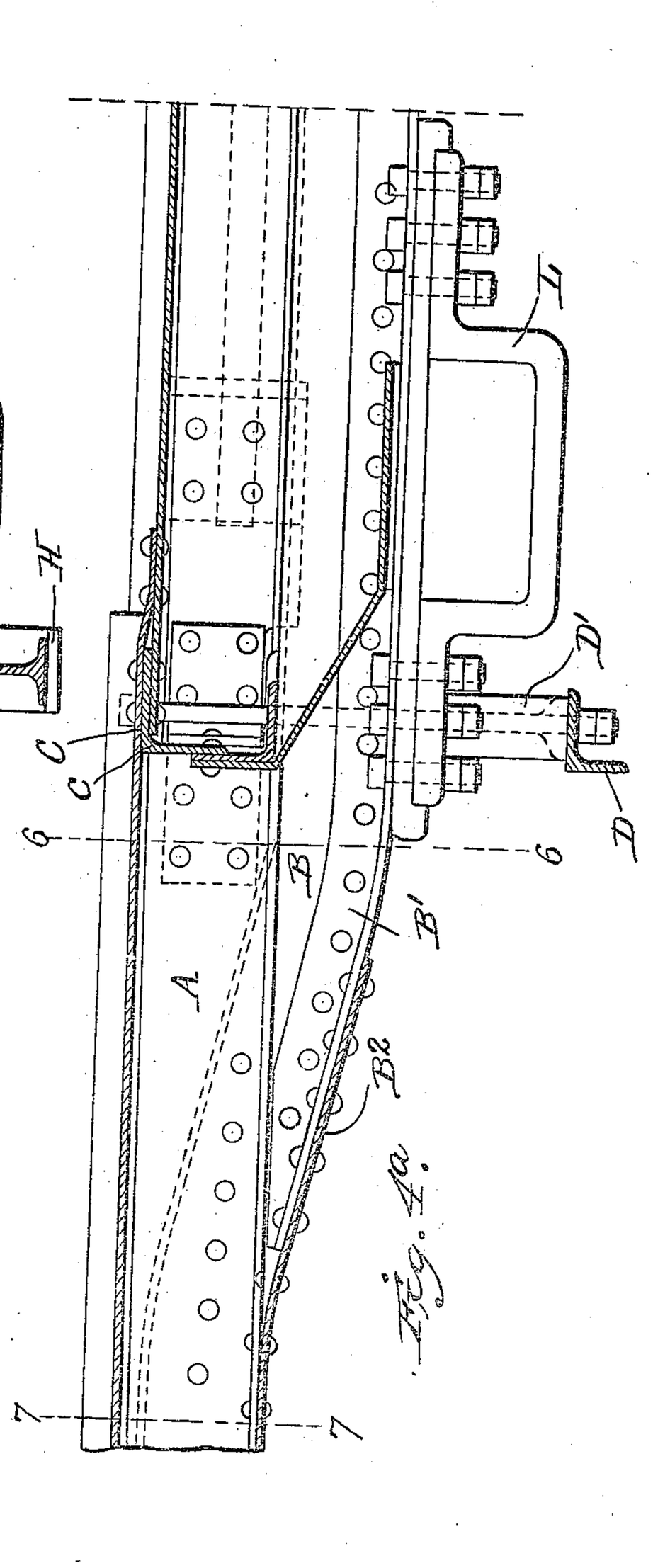


Fig. 1a.

Fig. 1.

Witnesses
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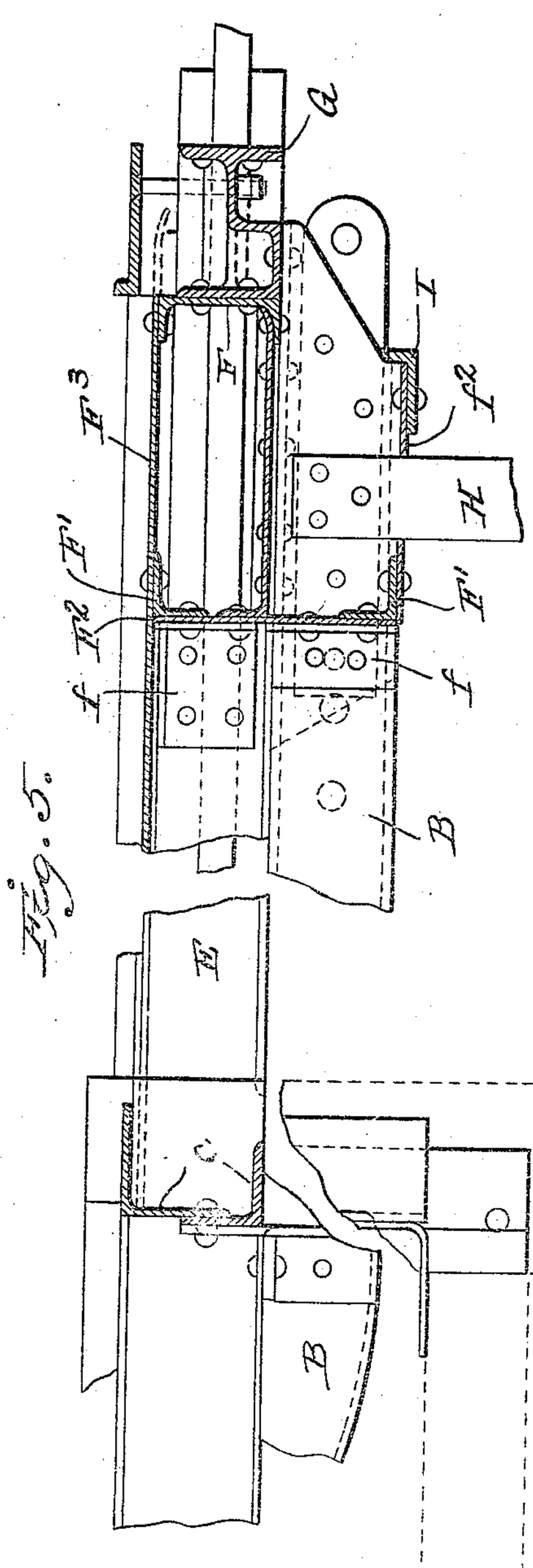

Fig. 5.

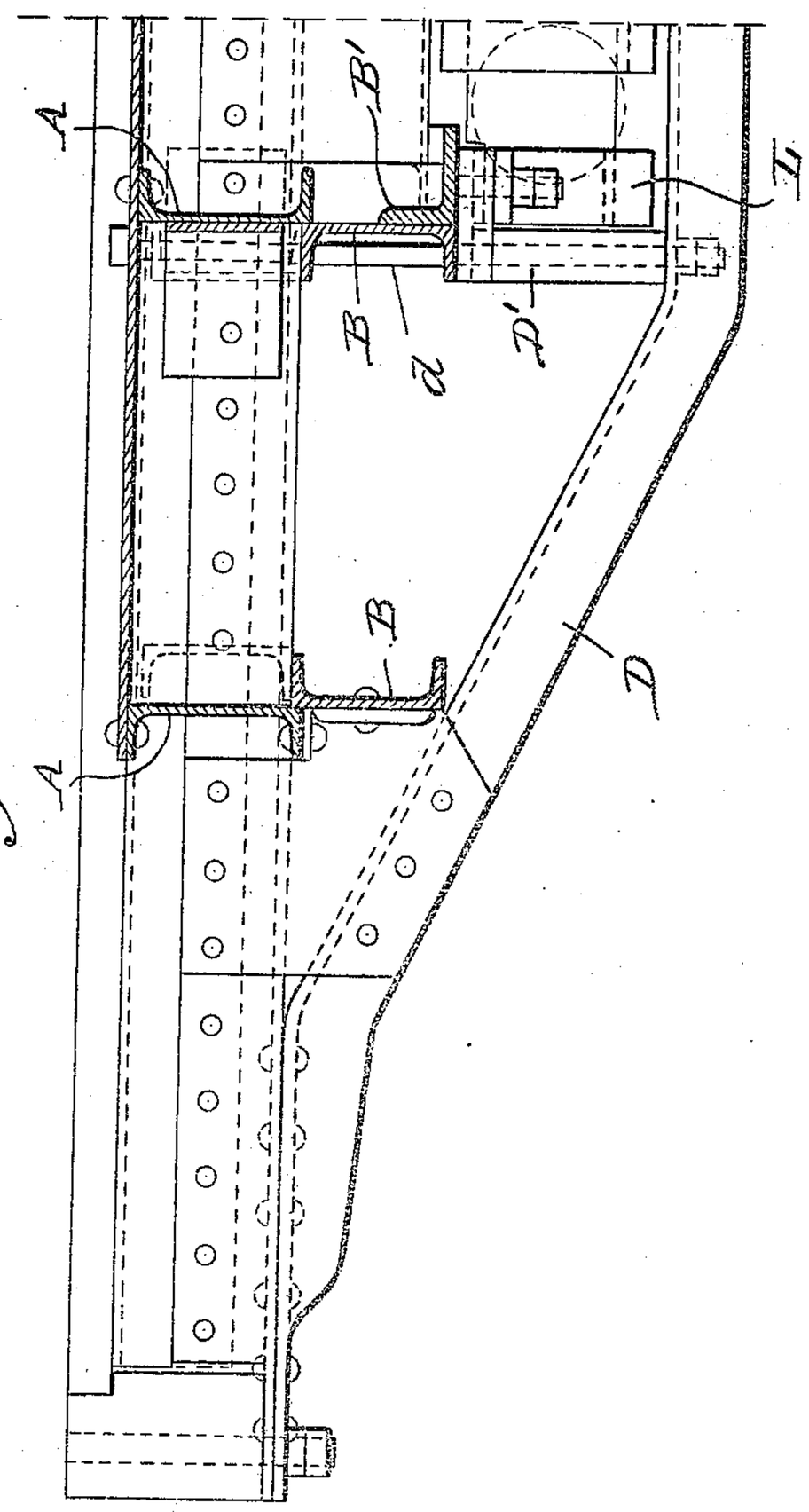

Fig. 6.

Witnesses

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5 SHEETS—SHEET 5.

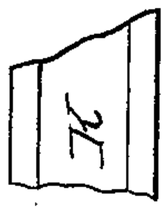


Fig. 7.

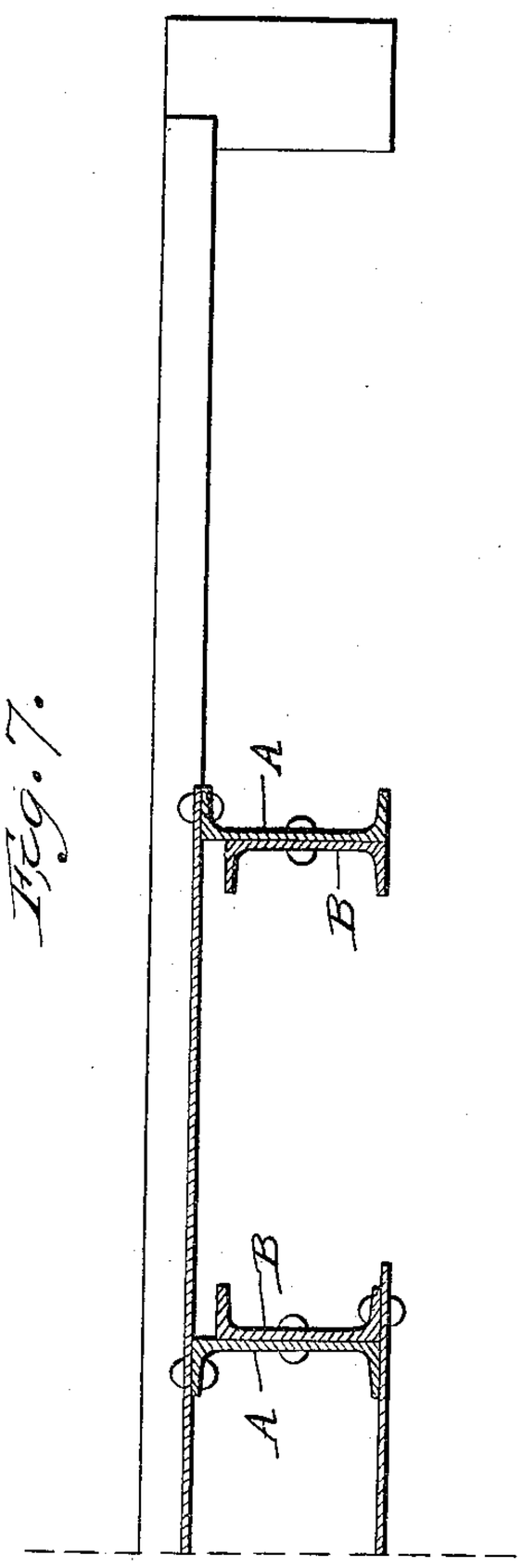


Fig. 8.

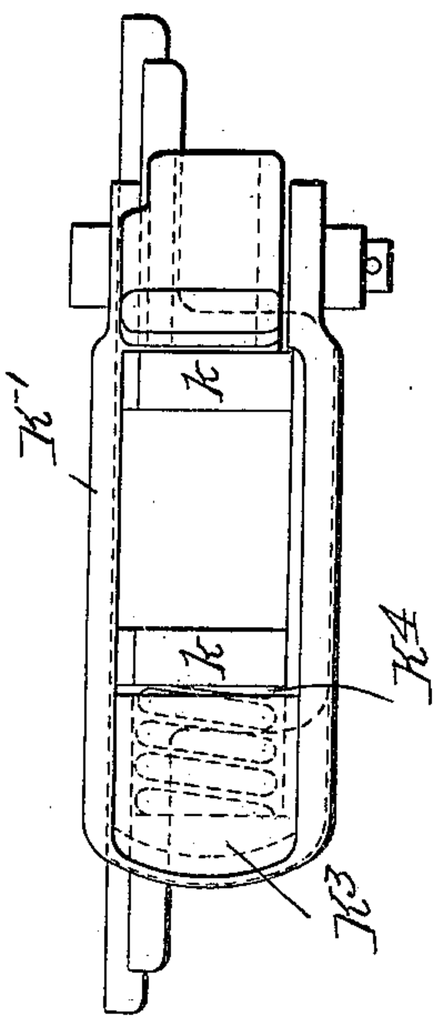
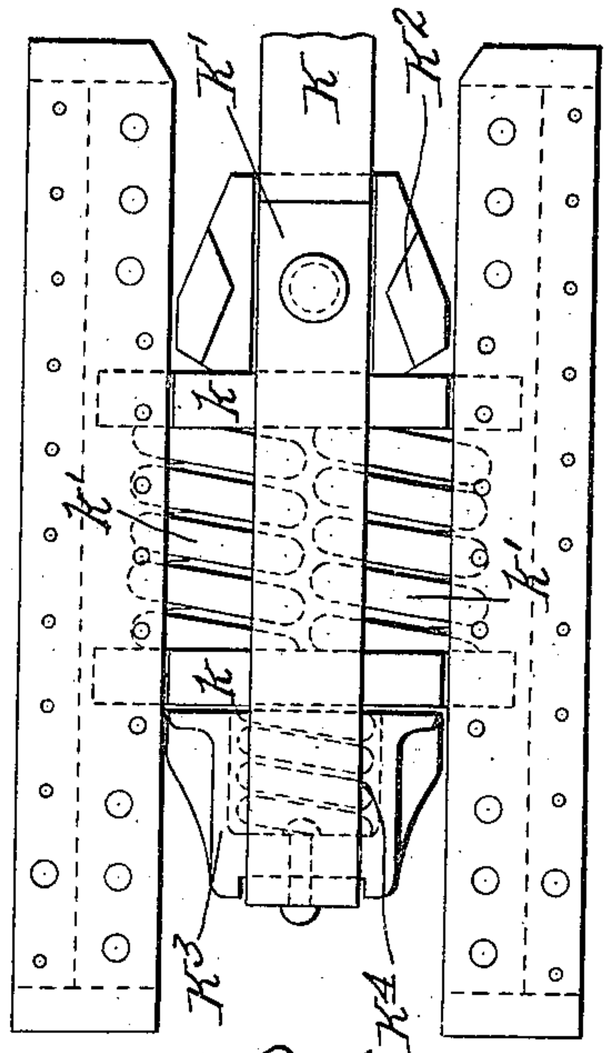


Fig. 9.



Witnesses

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UNITED STATES PATENT OFFICE.

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CAR CONSTRUCTION.

961,949. Specification of Letters Patent. Patented June 21, 1910.

Application filed May 21, 1909. Serial No. 497,489.

To all whom it may concern:

Be it known that I, RICHARD D. GALLAGHER, Jr., a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Car Construction; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the figures and letters of reference marked thereon.

This invention relates particularly to the construction of passenger cars and to the underframing, buffing and draft mechanism of the same.

The objects of the invention are to improve the construction and arrangement of the movable and resilient elements of the buffing mechanism, as well as the fixed pressure resisting elements for transmitting the strains to the body of the car.

The invention consists in certain novel details of construction and combinations and arrangements of parts, all as will now be described and pointed out particularly in the appended claims.

Referring to the accompanying drawings—Figure 1 is a plan view of a portion of a car frame and buffing mechanism at one end of a car lying on one side of the longitudinal center, the flooring and super-structure being removed; Fig. 2 is a front elevation of the parts shown in Fig. 1 with the movable parts of the buffing and draft mechanism removed. Fig. 3 is a vertical section on a line corresponding to the line 3—3, Fig. 1, but illustrating parts on the opposite side of the car from those shown in Figs. 1 and 2. Figs. 4 and 4A are sectional views in a central vertical plane, said views illustrating continuations of the same parts. Fig. 5 is a vertical section on the line 5—5, Fig. 1, with parts broken away. Fig. 6 is a transverse section on the line 6—6 Fig. 4A. Fig. 7 is a section on the line 7—7, Fig. 4A. Fig. 8 is a detail side elevation of a part of the draft gear centering mechanism. Fig. 9 is a top plan view of the centering mechanism, including the stop castings or spring pocket. Fig. 10 is a transverse section through the draft springs and parts immediately associated therewith.

Similar letters of reference indicate like parts in all the views.

The car frame illustrated in the accompanying drawings embodies main longitudinal sills A of channel-iron section and preferably extending from end to end of the car. In addition to the longitudinal sills A, supplemental longitudinal sills B are provided which, on the inner side of or between the end sills C of the body, are adapted to lie flat against the longitudinal sills A, as best seen in Fig. 7, the two thereby forming, in effect, longitudinal sills of I beam section.

The supplemental sills B are bent down to pass beneath the end sills C of the car, as best seen in Fig. 4A and they extend to the end of the car to form the draft timbers. By thus bending or offsetting the supplemental sills B they are, at a point within or between the end sills of the car elevated to a sufficient height to afford the necessary space for electric motors, etc., without weakening the frame construction and without tendency to throw the parts out of alinement under severe buffing or draft strain.

To reinforce the supplemental sills B, they may be provided with reinforcing angle iron edge pieces B′ at the lower edge and where they depart from the plane of the longitudinal sills A they may be conveniently riveted to suitable bottom strengthening plates B^2 (Fig. 4A).

The end sill C is built up across the ends of the sills A and is preferably formed of angle irons *c* riveted together and suitably connected to the ends of the sills A. Said end sill C is further braced and strengthened by an inverted truss-iron D secured thereto at its ends and passing down beneath the sill B and beneath the spacers or queen posts D′ through which bolts *d* pass upwardly to connect the truss and center sill at each side of the center. By this construction the supplemental sills B are held firmly against the bottom of the end sill C or the end sill is held firmly down on the supplemental sills B and the whole structure is united rigidly together. Forward of the end sill C longitudinal platform sills E are introduced above the supplemental sills B as best seen in Fig. 3, the said platform sills being of channel iron section and arranged reversely with respect to the supplemental

sills B whereby the overlapping flanges may be readily riveted or otherwise permanently connected together so as to form deep girders of great strength well adapted to resist lateral deflection and to transmit the buffing and draft strains to the body of the car. The buffer beam which is also built up of angle irons and plates, is rigidly mounted on the ends of the supplemental sills and longitudinal platform sills, thus, as shown particularly in Fig. 5 it will be seen that a curved channel iron F forms the front of the body of the buffer beam, and angle irons F′ connected by a plate F^2 form the rear wall of the buffer beam. The plate F^2 it is obvious need not be continuous from end to end of the buffer beam, but may be interrupted between the central longitudinal platform beams, but it is connected to said platform sills and to the supplemental sills B by brackets *f*. Between the angle iron F′ and channel F suitable bracing plates F^3 may be introduced, as shown in Figs. 1 and 5. To the front of the channel iron F at the center of the buffer beam there is secured the buffer beam extension G preferably made of malleable iron. Conveniently the extreme ends of the supplemental sills B extend under and support the buffer beam extension. The general contour of the forward face of the buffer beam extension is curved and at the ends of said extension, the buffer beam is strengthened and rounded by a filling piece G′ which may be of wood with a metal face *g*, the general curvature of said face conforming to the general curvature of the buffer beam extension for a purpose which will presently appear.

The lower angle iron F′ of the buffer beam is preferably arranged in the form of a downwardly bowed truss iron, as best seen in Fig. 2 of the drawings, so as to form with the bottom plate f^2 a connection which passes beneath the supplemental sills B and serves to impart additional strength to the buffer beam structure.

To the outer sides of the forward ends of the supplemental sills B there are attached hanger straps H for the carry-iron H′ of the draft mechanism, as will be readily understood from Figs. 2 and 4. To provide a smooth bearing for preventing the draft mechanism from moving upwardly and at the same time to permit it to swing laterally on the carry-iron H′, a wear plate I is mounted on the lower corners of the supplemental sills B and extends from one of the hanger straps H to the other, thus confining the draw bar to its channel between the irons H′ and I.

The draw-bar indicated by the letter K is, at its inner end, connected directly or indirectly with a yoke or strap K′ which is adapted to pass around the usual followers *k* having between them the draft springs *k′* (Fig. 9). The followers *k* are confined loosely within stop irons or spring pocket L (Fig. 4^A) depending from the under edges of the supplemental sill B and securely bolted to the strengthening flanges of said sills. For restoring the draft bar to its central position, the strap K′ at its forward end is provided with a block K^2 adapted to bear against the forward follower *k* and at its rear end it is provided with a cup or spring box K^3 adapted to confine within it a supplemental spring K^4 which rests against the rear follower *k*, the said spring K^4 being of less initial capacity than the draft springs, and there being only a slight play allowed between the spring box K^3 and the rear follower *k*. With this arrangement any draft strain or radial movement of the draw bar will initially compress the spring K^4 and if the draw bar is released while the spring is under compression it will be returned to its central position. The draft springs *k′* cannot ordinarily be utilized for this purpose, because of the difficulty in arranging the followers within the yokes so that no play can occur. Thus, if the spring pocket is too long, the device would be inoperative to bring the draw bar back to the center of the car, but with the present arrangement the parts are held tightly together and the spring K^4 exerts a constant tendency to return the parts to their central position, even though the follower and draft springs should not fill the space between the stop faces of the spring pocket.

By reference to Fig. 2 it will be seen that the buffer beam extension and buffer beam are provided with bearings M and M′ for the center and side stems *m* and *m′* of the buffer. Said stems are pivotally connected with the buffer at their forward ends and at their inner ends coöperate with the buffer springs and parts to be now described. The center stem *m* at its inner end passes through a bracket O held by a bridge piece O′ between the longitudinal platform sills and is prevented from outward movement by a key m^2. This limits the outward movement of the buffer at the center but without interfering with the capacity of said buffer to move angularly from, say the position indicated in full lines in Fig. 1 to the position indicated in dotted lines in said figure.

The side stems *m′* at their inner ends are supported in brackets O^2 and carry spring followers P and P′, the latter being mounted on the bracket O^2 and forming bearings for the inner end of the stem. Between the followers P and P′ two springs are confined, one lettered *p* being a relatively light spring with a long range of elasticity and the other *p′* being a relatively heavy spring. Said springs may be conveniently separated by a spacer p^2 and in operation it is intended that initial inward movements of the buffer shall

be resisted practically exclusively by the lighter springs p, the range of movement being such that the buffer may be moved inwardly until coupling is effected without undue resistance but from the coupling position to the final seating of the parts the resistance shall be greatly augmented owing to the fact that the movement of the outer springs is then entirely absorbed and the heavier springs are brought into action. To prevent deformation or setting of the lighter springs the follower P and spacer P^2 are adapted to contact when the initial movement resisted by said springs is ending and from thenceforth inward movement is resisted entirely by the heavier springs. During the initial inward movement of the buffer the center stem m (Fig. 4) is not designed to exert any outward pressure, owing to the fact that its shoulder q is normally spaced away from the coöperating shoulder q' of its forward follower Q and consequently the center stem spring Q′ located between the follower Q and the bracket O is not put under increasing tension until the shoulders q and q' engage and move the follower Q inwardly. Forward movement of the follower Q is limited by the buffer beam, whereby the side springs p will, in effect, give the final outward movement to the buffer and will alone resist initial inward movement of the same.

The arrangement of the springs described permits of a very wide range of angular movement of the buffer as, for instance, when rounding short curves and, in order to take care of the coöperating buffers under extreme conditions, the parts are so proportioned and the outer face of the buffer beam is so shaped at the ends that the cooperating buffer will, when occupying a position at one side of the center, bear against the rounding face of the buffer beam. This extreme condition is illustrated in Fig. 1 where the coöperating buffer or buffer on the adjacent car is indicated by the dotted lines S and it will be noted that in the extreme position indicated, one car being on a tangent and the other on a short curve, the buffers are parallel with each other, but are displaced transversely and each will partly rest against its coöperating buffer and partly against the cöoperating filling piece of the buffer beam. The arrangement insures a good platform or bridge between cars at all times and further insures a proper buffing action, even under extreme conditions.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States, is:—

1. In car construction, the combination with the main sills extending longitudinally of the car, an end sill against which the longitudinal sills abut, a buffer beam and platform sills intermediate and connected with the buffer beam and end sill, all of said parts being in the same horizontal plane, of supplemental sills extending longitudinally of the car and secured to the sides of the main longitudinal sills on the inner side of the end sill, the ends of said supplemental sills being bent down below the end sill and extended forward in direct contact with and forming the support for the end sill, platform sills and buffer beam.

2. In car construction, the combination with the main sills extending longitudinally of the car, an end sill forming an end abutment for the main sills, and extending transversely beyond the main sills at each side, a buffer beam and platform sills intermediate and rigidly connected with both the end sill and buffer beam, of supplemental sills arranged parallel with the main sills, the inner ends of the supplemental sills being in the plane of and secured to the sides of the main sills and their outer ends being below and directly supporting the end sill, buffer beam, and platform sills, the intermediate portions of the supplemental sills being bent to connect the ends which lie in different horizontal planes and strengthening irons secured to the bent portions of the supplemental sills.

3. In car construction, the combination with the end sill, buffer beam and main longitudinal sills of channel iron section, extending in the plane of the end sill and buffer beam, of the supplemental sills of channel iron section secured to the sides of the main sills and having their ends bent down to underlie and support the end sill and buffer beam and edge strengthening irons of L-section secured to the depressed ends of the center supplemental sills.

4. In car construction, the combination with the end sill, buffer beam and main longitudinal sills extending in the plane of the end sill and buffer beam, of the supplemental sills located in the plane of the main sills and having their ends bent down to underlie and support the end sill and buffer beam strengthening irons secured to the bent portions of the supplemental sills and a truss iron passing from the ends of the end sill under the supplemental sills.

5. In car construction, the combination with the end sill, buffer beam and main longitudinal sills extending in the plane of the end sill and buffer beam, of the supplemental sills located in the plane of the main sills and having their ends bent down to underlie and support the end sill and buffer beam, a truss iron extending from the end sill under the supplemental sills and queen posts interposed between the truss and supplemental sills to form a space for the draft gear.

6. In car construction, the combination with the end sill, buffer beam and main lon-

gitudinal sills extending in the plane of the end sill and buffer beam, of the supplemental sills located in the plane of the main sills and having their ends bent down to underlie and support the end sill and buffer beam, a truss iron extending from the end sill under the supplemental sill, queen posts interposed between the truss iron and supplemental sills to form a space for the draft gear and a truss iron extending from the ends of the buffer beam under the supplemental sills above the space for the draft gear.

7. In car construction, the combination with the end sill, buffer beam and main longitudinal sills extending in the plane of the end sill and buffer beam, of the supplemental sills located in the plane of the main sills and having their ends bent down to underlie and support the end sill and buffer beam, a downwardly bowed truss iron forming a part of the buffer beam and extending beneath the supplemental sills, hangers secured to the supplemental sills, and a draft gear carry-iron supported by said hangers, substantially as described.

8. In car construction, the combination with the end sill, buffer beam and main sills extending in the plane of the end sill and buffer beam, of supplemental sills located in the plane of the main sills and having their ends bent down to underlie and support the end sill, buffer beam and longitudinal platform sills overlying and resting on the depressed ends of the supplemental sills between the end sill and buffer beam and a downwardly bowed truss iron forming a part of the buffer beam extending beneath and secured to the supplemental sills.

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Witnesses:

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