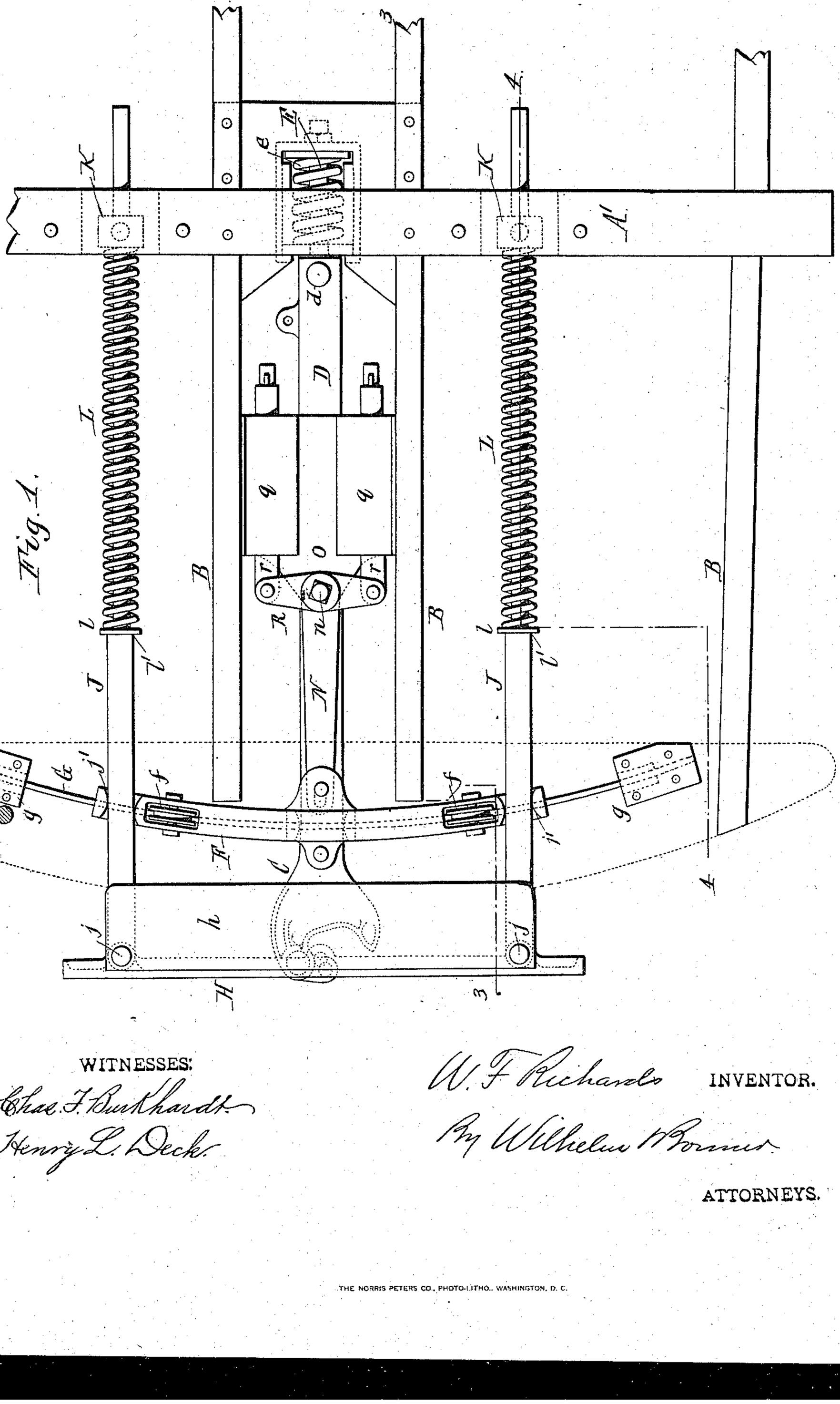
(No Model.) 4 Sheets—Sheet 1.

W. F. RICHARDS.

CAR BUFFER.

No. 568,072. Patented Sept. 22, 1896.



WITNESSES:

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Henry L. Deck.

W. F. Richards INVENTOR.

By Wilhelm Bonner

ATTORNEYS.

(No Model.) 4 Sheets—Sheet 2.

W. F. RICHARDS.

CAR BUFFER.

No. 568,072. Patented Sept. 22, 1896.

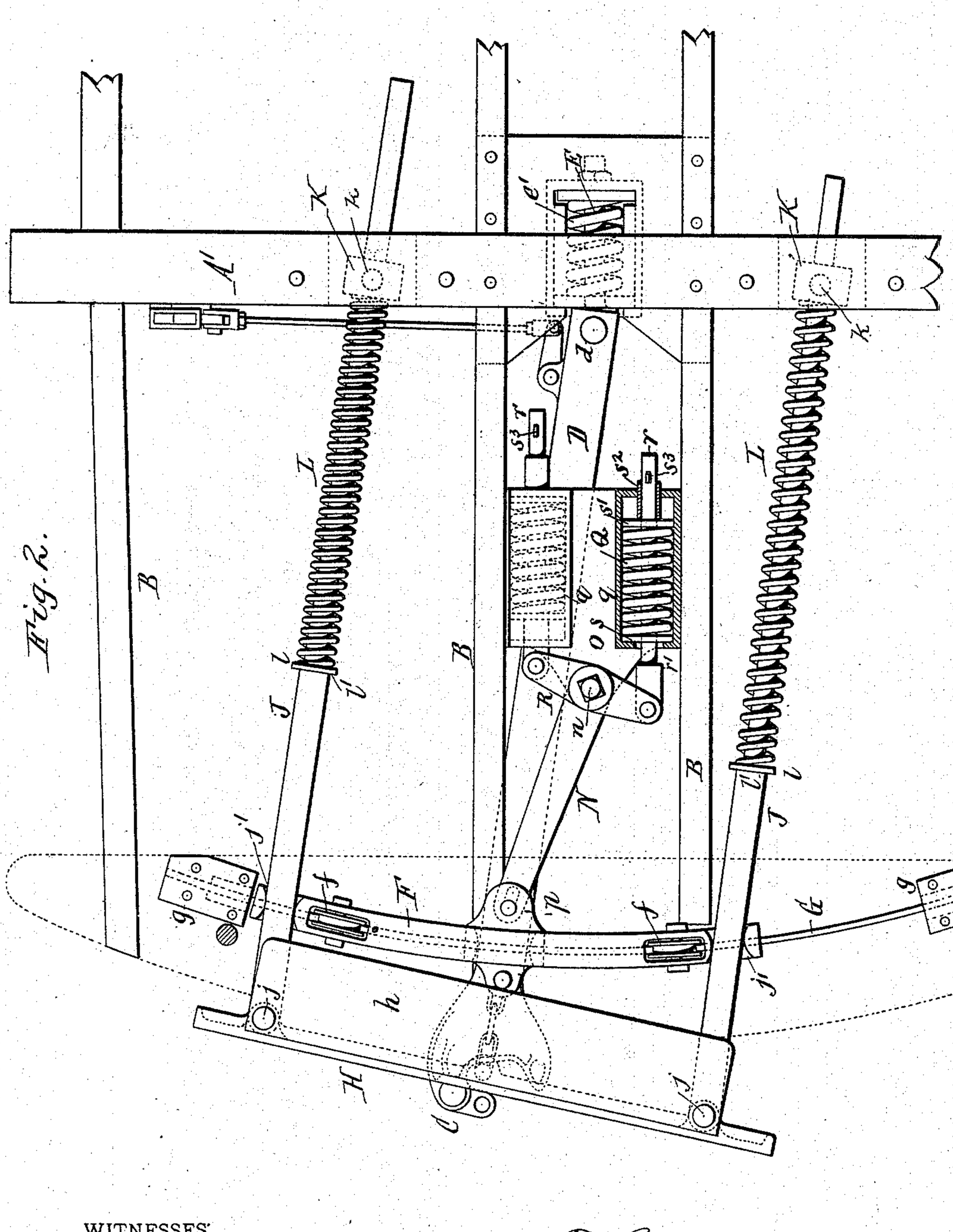

Fig. 2.

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(No Model.)

4 Sheets—Sheet 3.

W. F. RICHARDS.

CAR BUFFER.

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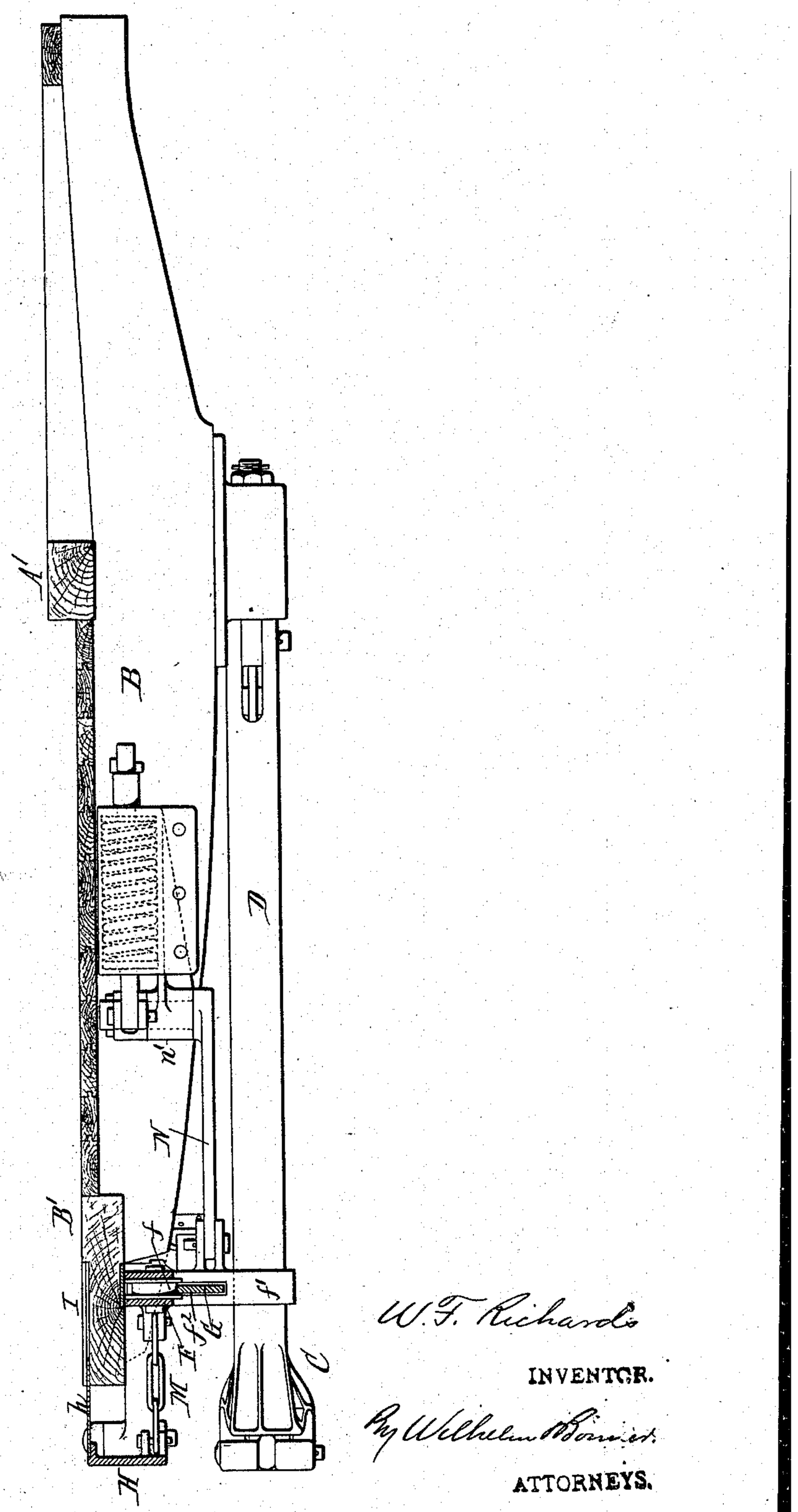

Fig. 3.

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(No Model.) 4 Sheets—Sheet 4.

W. F. RICHARDS.

CAR BUFFER.

No. 568,072. Patented Sept. 22, 1896.

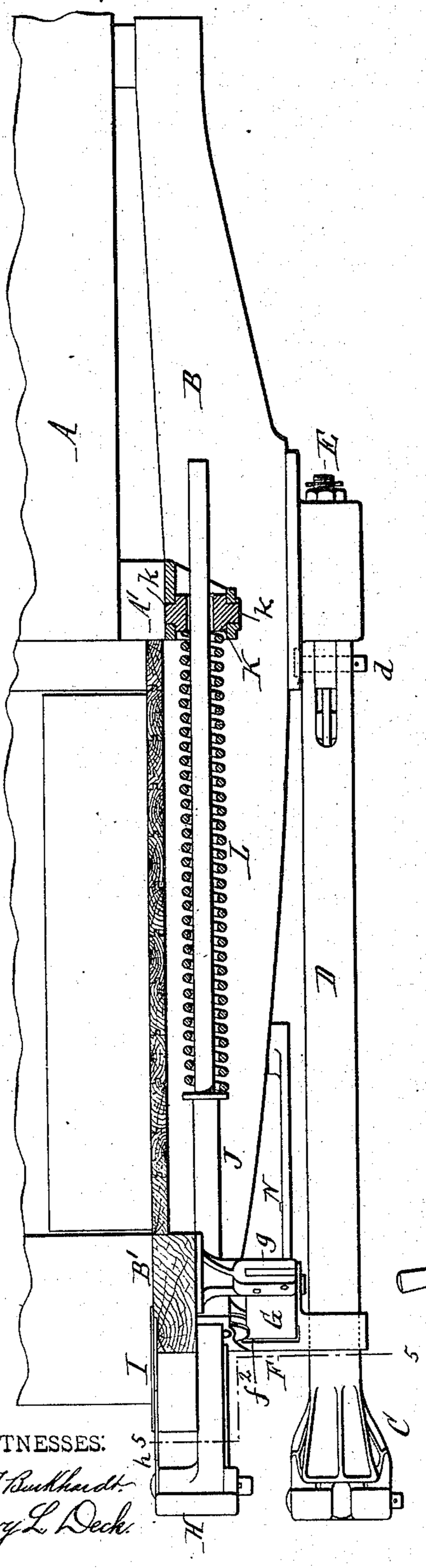

Fig. 4.

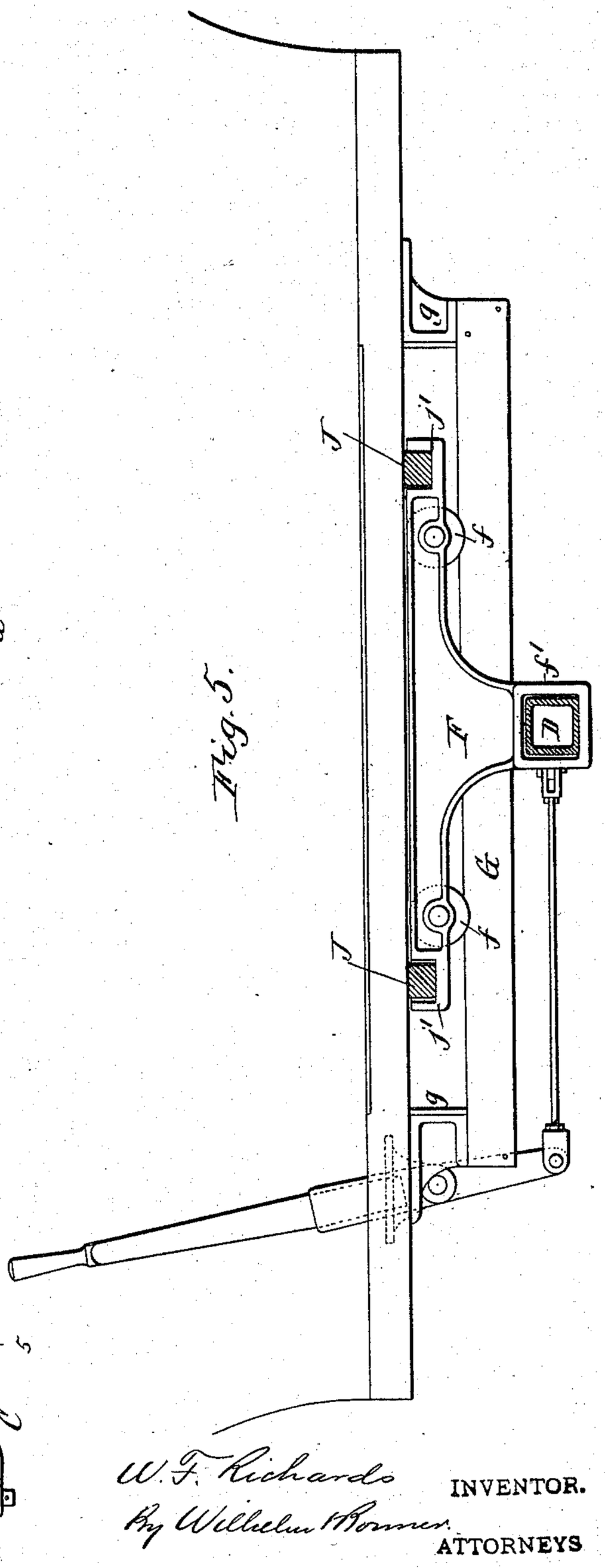

Fig. 5.

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UNITED STATES PATENT OFFICE.

WILLARD F. RICHARDS, OF BUFFALO, NEW YORK, ASSIGNOR TO THE GOULD COUPLER COMPANY, OF NEW YORK, N. Y.

CAR-BUFFER.

SPECIFICATION forming part of Letters Patent No. 568,072, dated September 22, 1896.

Application filed June 27, 1896. Serial No. 597,111. (No model.)

To all whom it may concern:

Be it known that I, WILLARD F. RICHARDS, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Car-Buffers, of which the following is a specification.

This invention relates to that class of car-buffers which have a considerable range of lateral movement, so as to maintain a continuous passage-way between adjoining cars in passing around sharp curves as well as in running upon straight sections of track, and more particularly to a buffer which is connected with the drawbar so as to move laterally in unison therewith, such a buffer forming the principal subject of another application for patent filed by me April 27, 1896, Serial No. 589,283.

The object of my present invention is the production of an efficient buffer of this kind which is especially adapted to street-cars.

In the accompanying drawings, consisting of four sheets, Figure 1 is a fragmentary top plan view of a car-platform provided with my improved buffer with the flooring of the platform omitted, showing the buffer in its central position. Fig. 2 is a similar view showing the buffer moved toward one side of the platform. Fig. 3 is a vertical longitudinal section in line 3 3, Fig. 1. Fig. 4 is a similar section in line 4 4, Fig. 1. Fig. 5 is a cross-section in line 5 5, Fig. 4.

Like letters of reference refer to like parts in the several figures.

A is the car-body; A′, its end sill; B, the longitudinal platform-sills, and B′ the end sill of the platform.

C is the car-coupler, which is preferably of the automatic type now in common use on the cars of steam-railroads, but made of smaller dimensions, and D is the shank or draw-bar, which has its rear end pivotally connected with the car-frame in such a manner as to permit the coupling to swing laterally to the requisite extent. In the construction shown in the drawings the draw-bar is pivoted by a vertical pin *d* to the draft-bolt E, having followers, between which a combined draft and buffer spring *e′* is interposed. The outer portion of the draw-bar is supported by a transversely-movable carriage F, running upon a track G, which is suspended from the under side of the end sill of the platform by hangers *g*. This carriage is provided at or near its ends with rollers *f* and midway between said rollers with a horizontal yoke or sleeve *f′*, which extends below the track G and in which the front portion of the draw-bar is loosely supported, as shown. The carriage and its track are curved substantially as shown, and the carriage is provided with an opening f^2 for the passage of the track.

H is the buffer, which preferably consists of a continuous upright plate arranged transversely in front of the end sill of the platform and extending nearly to the sides of the platform and provided with a horizontal plate or wing *h*, extending rearwardly from its upper edge and overlapping the end sill of the platform. The latter is recessed to receive the horizontal plate of the buffer, and the joint between said plate and the end sill is covered by a threshold-plate I, secured at its inner end to the end sill, as shown in Figs. 3 and 4.

The buffer is carried by two longitudinal stems or bars J, pivoted at their front ends to the buffer by vertical pins or bolts *j* and supported near their front ends in seats *j′*, formed in the end portions of the carriage F above the track G, so as to move laterally with the carriage. The buffer-stems rest loosely in these seats, so as to be capable of longitudinal movement on the carriage, and the seats are flared at both ends, as shown in Figs. 1 and 2, to permit the necessary angular movement of the stems when the buffer moves toward either side of the car. The rear portions of the buffer-stems slide loosely in swiveling blocks or bearings K, arranged in recesses of the end sill A′ of the car and provided at their upper and lower ends with trunnions *k*, which are journaled in openings in the upper and lower sides of said recesses, so as to permit the buffer-stems to swing on the car-frame and at the same time play lengthwise in the swiveling blocks in following the inward and outward movement of the buffer.

L represents the buffer-springs, which re-

sist the inward movement of the buffer, and which surround the buffer-stems, respectively, between the front sides of the blocks K and washers *l*, applied to the front portions of the stems and bearing against shoulders *l'* of the stems.

M is a flexible connection, such as a chain, which is attached at its outer end to the central portion of the buffer and at its inner end to the carriage F, and which limits the outward movement of the buffer beyond its operative position.

N is an oscillating arm or lever arranged on the under side of the platform in rear of the carriage F and provided at its rear end with an upwardly-extending pivot *n*, journaled in a bearing *n'*, which is preferably formed on a horizontal plate O, secured between the longitudinal center sills of the platform. The front end of the lever N is pivoted by an upright pin to a bifurcated lug *p*, projecting rearwardly from the middle of the carriage F.

Q Q represent springs, which tend to retain the carriage F and the parts carried thereby in their central position, and which return the parts to that position when the car passes from a curve upon a straight section of track. These centering-springs are arranged in separate longitudinal casings *q*, supported on the plate O.

r r represent longitudinal compression rods or stems pivoted at their front ends to opposite ends of a cross-head R, secured centrally to the projecting upper end of the lever-pivot and passing, respectively, through the springs Q and their casings *q*. Each of the centering-springs bears at its outer end against a follower or washer *s*, arranged loosely on the stem *r* between the spring and the front head of its casing, while the rear end of the spring bears against a similar washer *s'*, which is arranged between the spring and the rear head of its casing, and which in turn bears against a tubular follower or sleeve s^2, arranged loosely on the rear portion of the stem and sliding in an axial opening in the rear head of the casing. Each stem *r* is provided in rear of the tubular follower s^2 with a key or stop s^3, which limits the forward movement of the stem in said follower and compels the follower to move forward with the stem as soon as the key comes in contact with the rear end of the follower. On the front portion of each stem *r* is a shoulder *r'*, which is adapted to bear against the front follower *s* when the stem is moved inwardly.

When a car equipped with my improved buffer is coupled to another car and the buffer is moved toward one side of the car in rounding a curve, the carriage F moves laterally with the buffer, and as the oscillating lever N is connected with the carriage the same is swung in the same direction, thereby moving the compression-rods *r* lengthwise in opposite directions, the rod facing the inner side of the curve being pushed rearwardly and the rod facing the outer side of the curve being drawn forwardly, as shown in Fig. 2. By this forward movement of the outer rod its key s^3 comes in contact with the rear or tubular follower s^2 and draws the latter, the washers *s s'*, and the spring Q bodily forward until the front washer strikes the front head of the spring-casing, when the continued forward movement causes the rear follower to compress the spring. By the rearward movement of the inner compression-rod, which takes place simultaneously with the forward movement of the outer rod, the shoulder *r'* of the latter comes in contact with the front washer or follower *s* and causes the latter to shift the spring rearward bodily until the rear washer *s'* strikes the rear head of the spring-casing, as shown by dotted lines in Fig. 2, when the continued rearward movement of the rod causes the front washer *s* to compress the spring. During this rearward movement of the rod the same slides freely through the tubular follower. The lateral movement of the buffer thus causes the two centering-springs to be compressed in opposite directions, and as soon as the car passes upon a straight track-section the springs react and swing the lever into its central position through the medium of the rods *r* and the several followers, and the lever in turn shifts the carriage and the buffer and draw-bar connected therewith to their central position. The compression-rods are fitted in the spring-casings with sufficient looseness to prevent binding thereof. By this construction and arrangement of the centering-springs the same are rendered very compact and especially adapted to the conditions of street-cars, and they are compressed in a straight line, whereby all liability of buckling the same is avoided.

The buffer forms with the buffer of an opposing car a closed and continuous passage-way between the cars, which is maintained upon curves as well as straight sections of the track by the connection of the buffer with the draw-bar, which connection causes the buffer to follow the lateral movements of the draw-bar.

I claim as my invention—

1. The combination with a car-platform and a laterally-movable buffer arranged at the end thereof, of an oscillatory arm or lever connected with the buffer and having a cross-head at its pivoted end, and centering-springs arranged lengthwise of the car and operating upon the arms of said cross-head, substantially as set forth.

2. The combination with the car-frame and a laterally-movable draw-bar, of an oscillating arm or lever connected with the draw-bar and having a cross-head, and centering-springs operating upon the arms of said cross-head and resisting the lateral movement of said oscillating arm, substantially as set forth.

3. The combination with a car-platform and

a laterally-movable buffer arranged at the end of the platform, of an oscillating arm or lever connected with the buffer and having a cross-head, a pair of centering-springs, and compression-rods connected respectively with the arms of said cross-head and operating to compress said springs in opposite directions, substantially as set forth.

4. The combination with the car-frame and a laterally-movable draw-bar, of an oscillating arm or lever connected with the draw-bar and having a cross-head, a pair of centering-springs and compression-rods, connected respectively with the arms of said cross-head and operating to compress said springs in opposite directions, substantially as set forth.

5. The combination with the car-platform, and a laterally-movable buffer arranged at the end thereof, of an oscillating arm or lever arranged on the under side of the platform, connected with the buffer and provided with a cross-head, a pair of longitudinal centering-springs arranged in rear of said oscillating lever and supported in suitable casings, compression-rods passing through said springs and connected respectively to the arms of said cross-head, and followers arranged on said rods between the ends of each spring and the opposing heads of their casings, substantially as set forth.

6. The combination with the car-platform, and a laterally-movable buffer arranged at the end thereof, of an oscillating arm or lever arranged on the under side of the platform, connected with the buffer and provided with a cross-head, a pair of longitudinal centering-springs arranged in rear of said oscillating lever and supported in suitable casings, compression-rods passing through said springs and connected respectively, to the arms of said cross-head, a washer or follower arranged on each of said rods between the front end of the spring and the front head of the spring-casing, and a tubular rear follower arranged on said rod between the rear end of the spring and the rear head of the spring-casing, said rods being provided in front of the spring-casings with shoulders adapted to bear against said front followers and on their rear portions with stops adapted to bear against said tubular followers, substantially as set forth.

7. The combination with a car-platform, of a transverse track arranged on the under side of the platform, a carriage running upon said track, and a laterally-movable buffer and a laterally-movable draw-bar both supported upon said carriage whereby the buffer and draw-bar are moved laterally in unison, substantially as set forth.

8. The combination with a car-platform and a laterally-movable draw-bar, of a buffer arranged at the end of the platform, and having laterally-movable supporting-stems, a transverse track arranged on the under side of the platform and a carriage running on said track and provided above said track with seats for said buffer-stems and below said track with a yoke or seat in which the draw-bar is supported, substantially as set forth.

Witness my hand this 16th day of June, 1896.

WILLARD F. RICHARDS.

Witnesses:
KATHRYN ELMORE,
ELLA R. DEAN.