

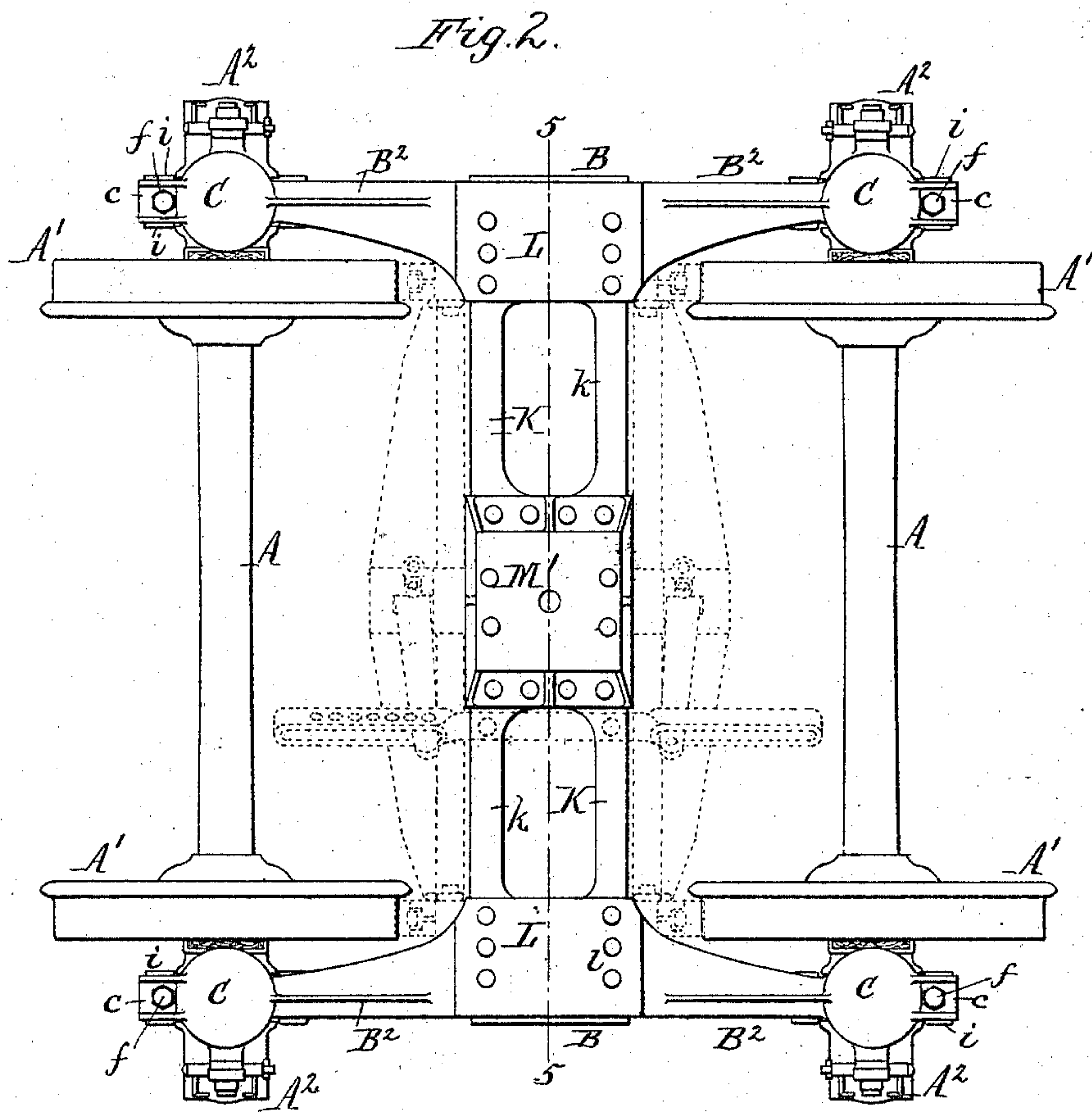
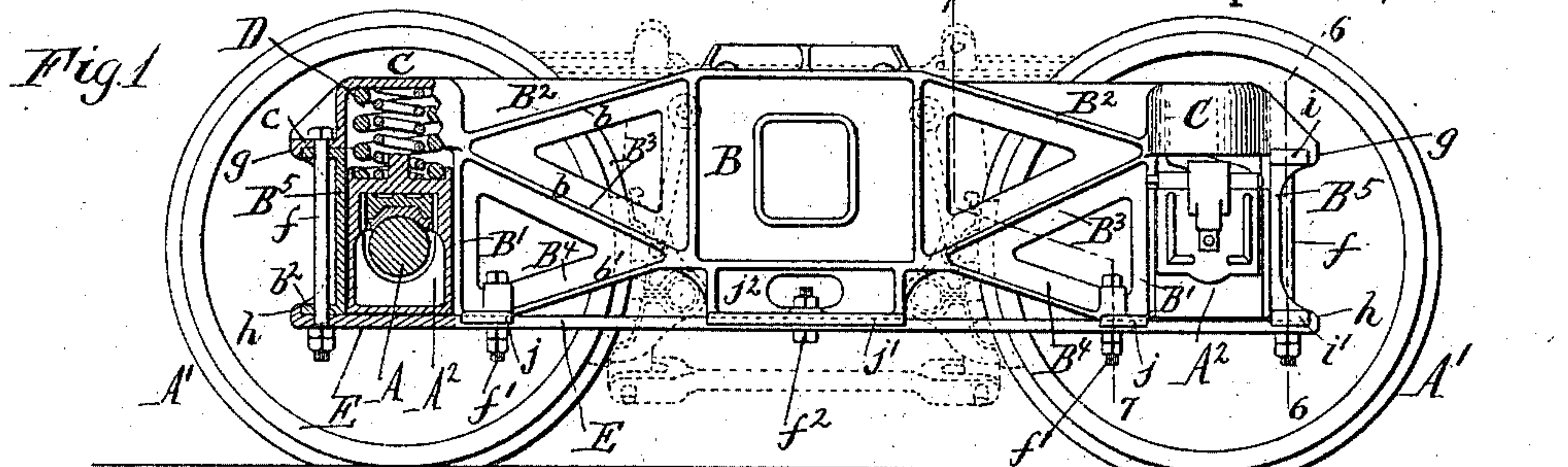
(No Model.)

3 Sheets—Sheet 1.

W. F. RICHARDS.  
CAR TRUCK.

No. 580,534.

Patented Apr. 13, 1897.



Witnesses:

Ernest Pulsford.  
F. Gustav Wilhelm.

W. F. Richards Inventor.  
By Wilhelm Bousset  
Attorneys.

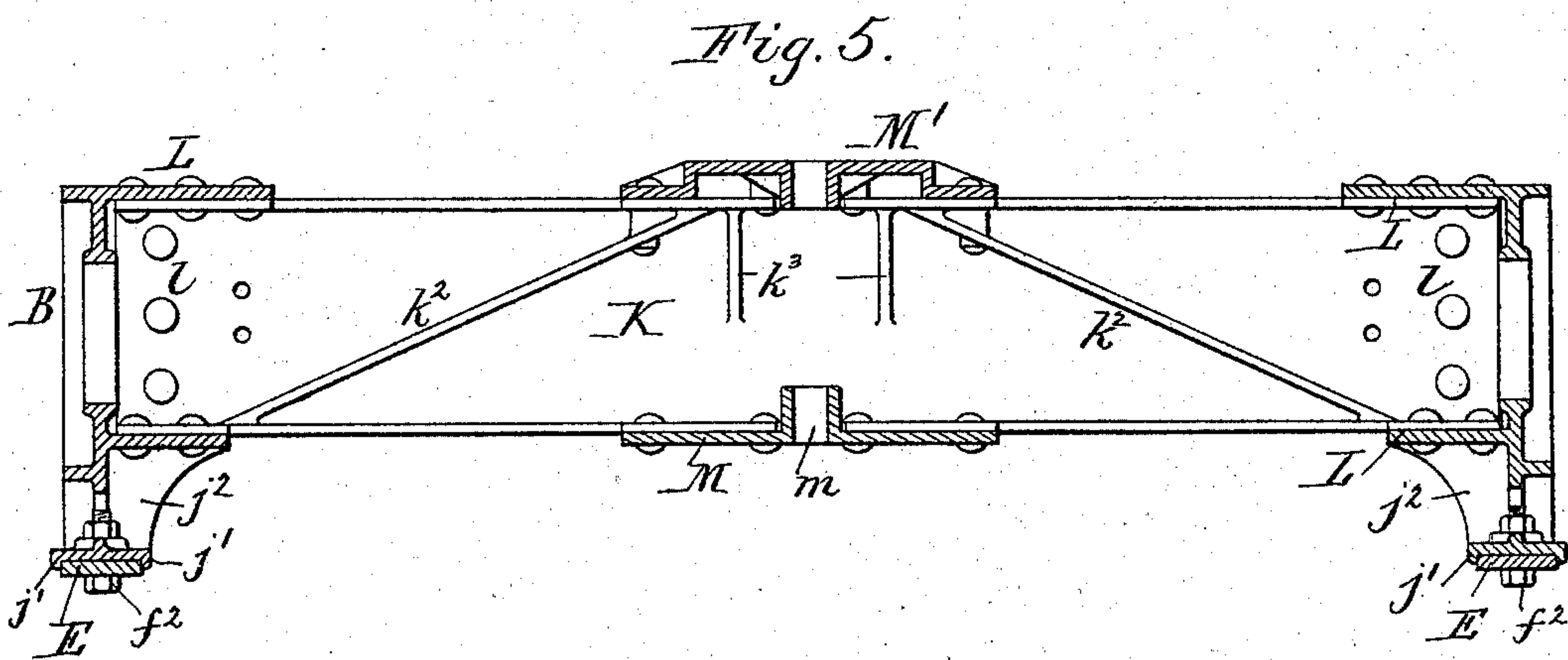
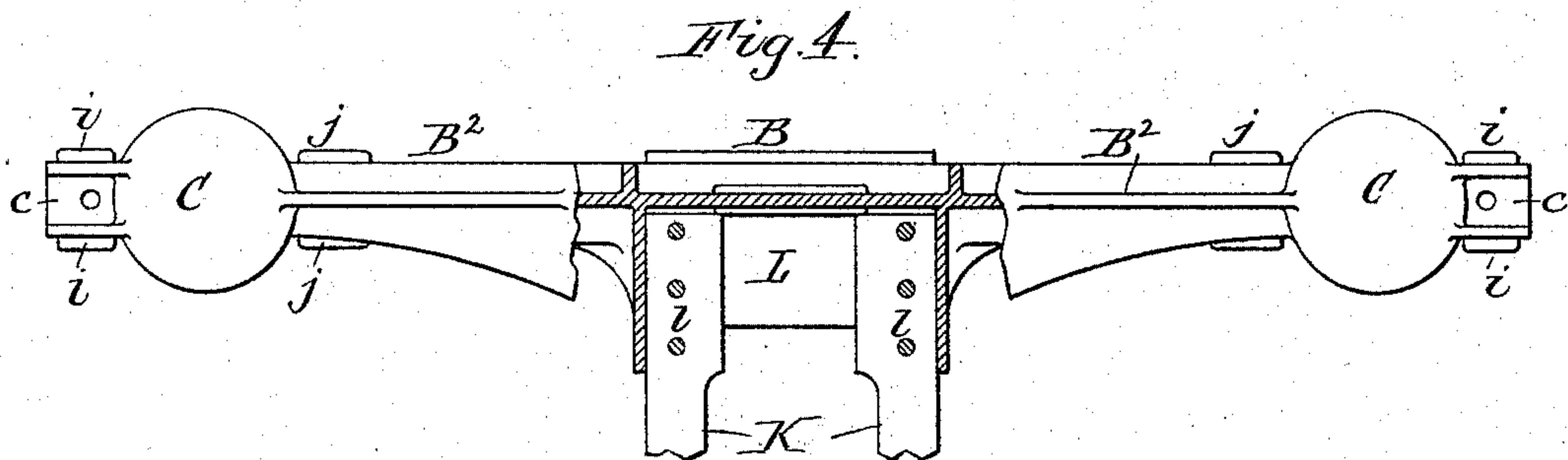
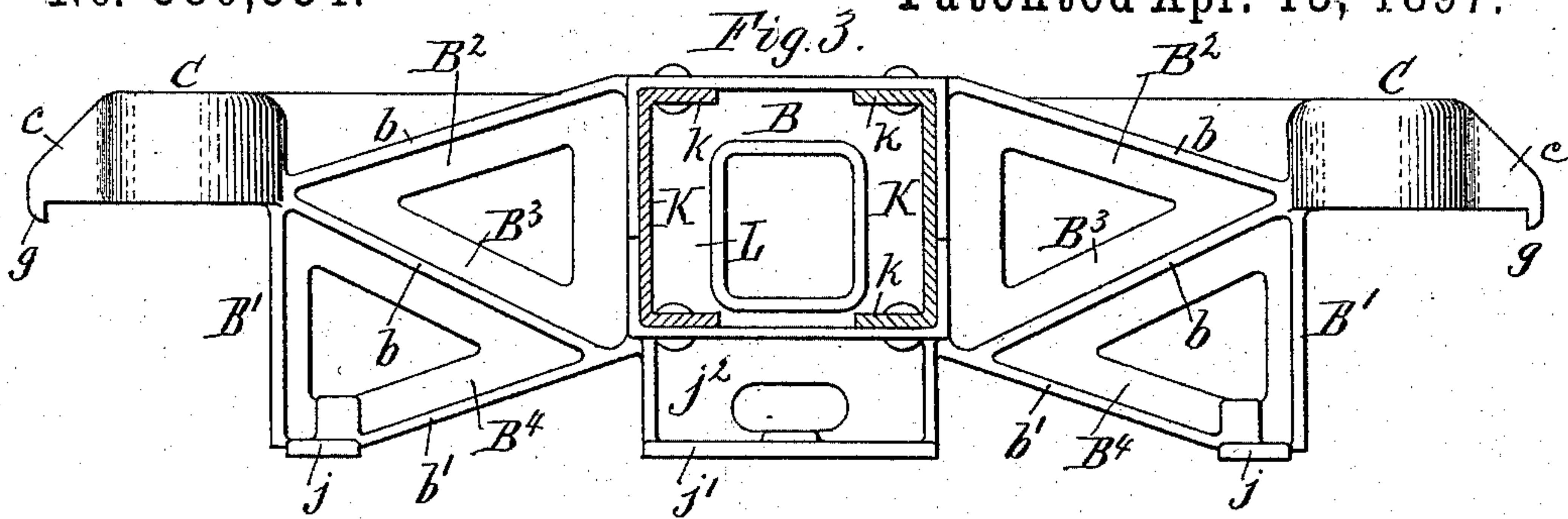
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3 Sheets—Sheet 2.

W. F. RICHARDS.  
CAR TRUCK.

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W. F. RICHARDS.  
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3 Sheets—Sheet 3.

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Fig. 9.

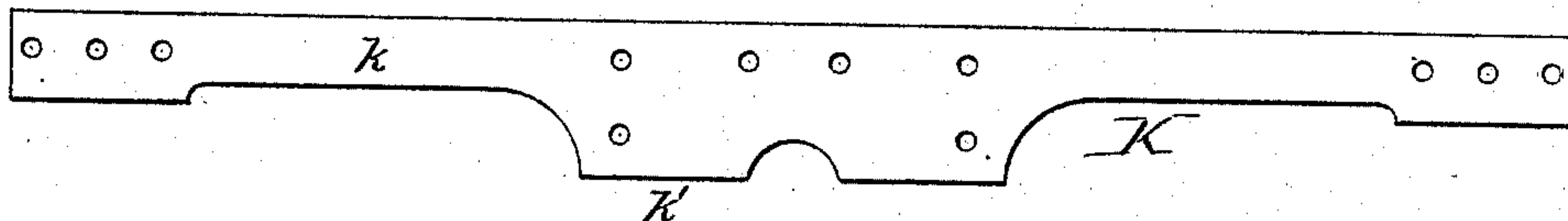


Fig. 6.

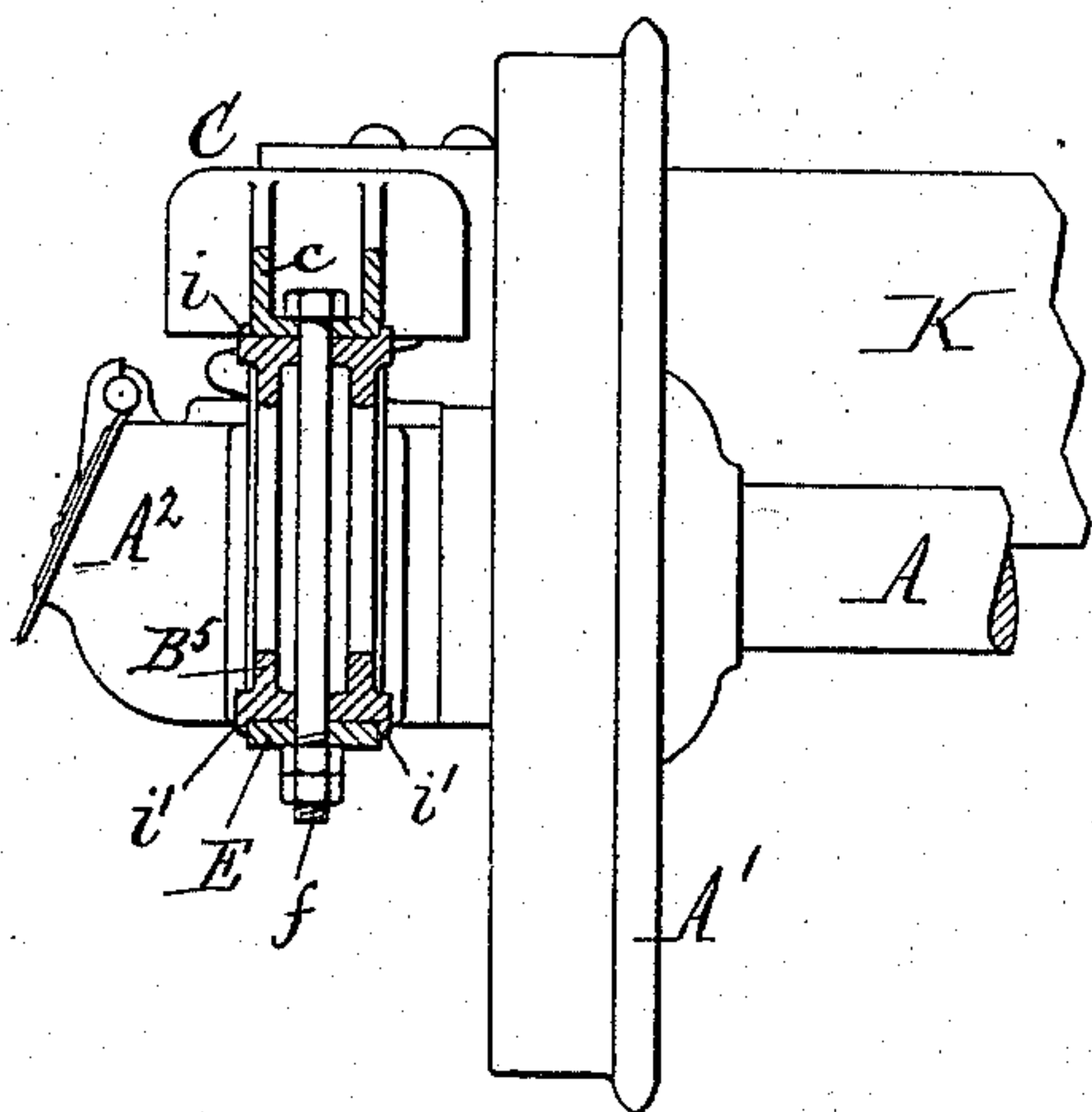


Fig. 7.

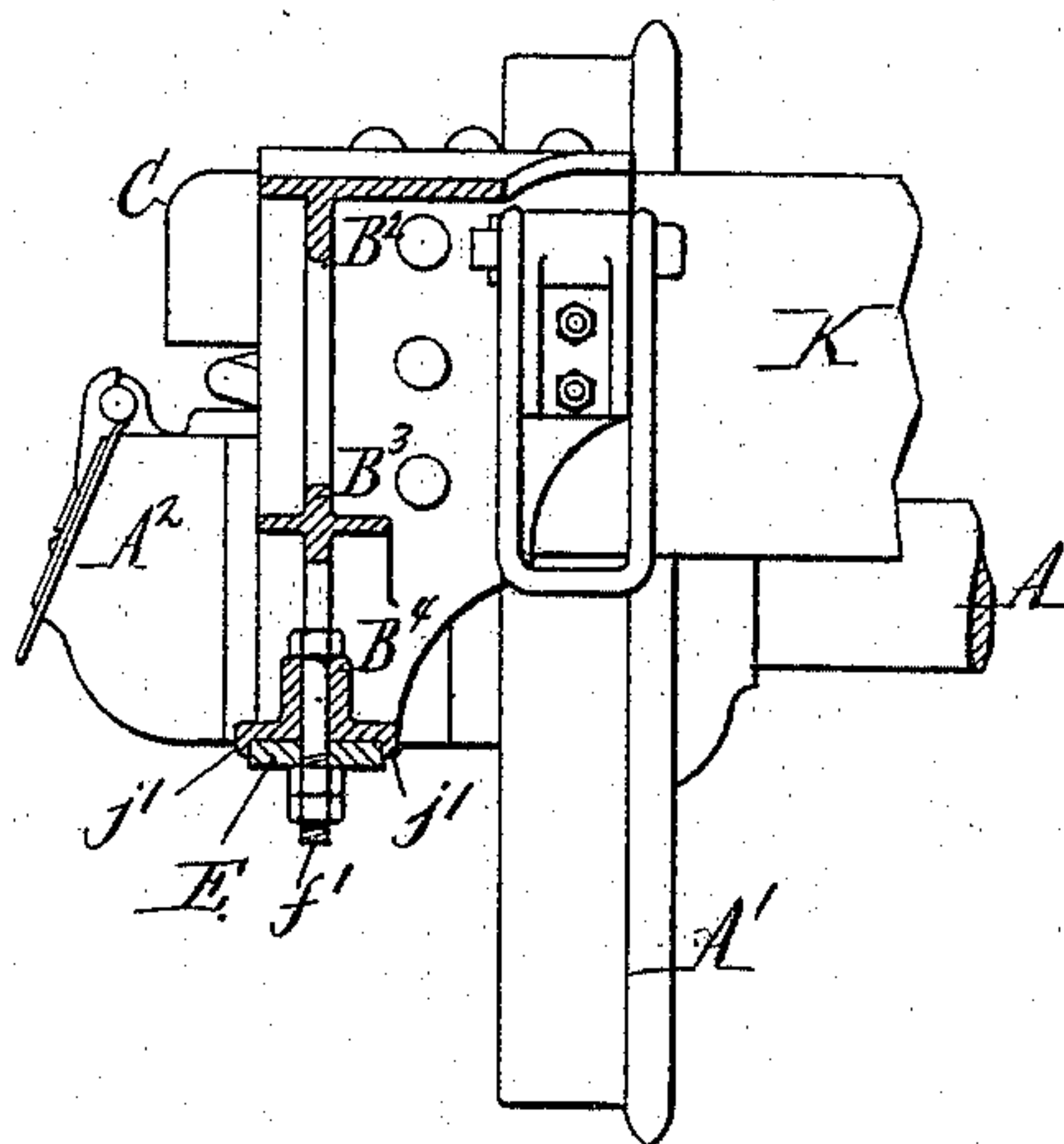
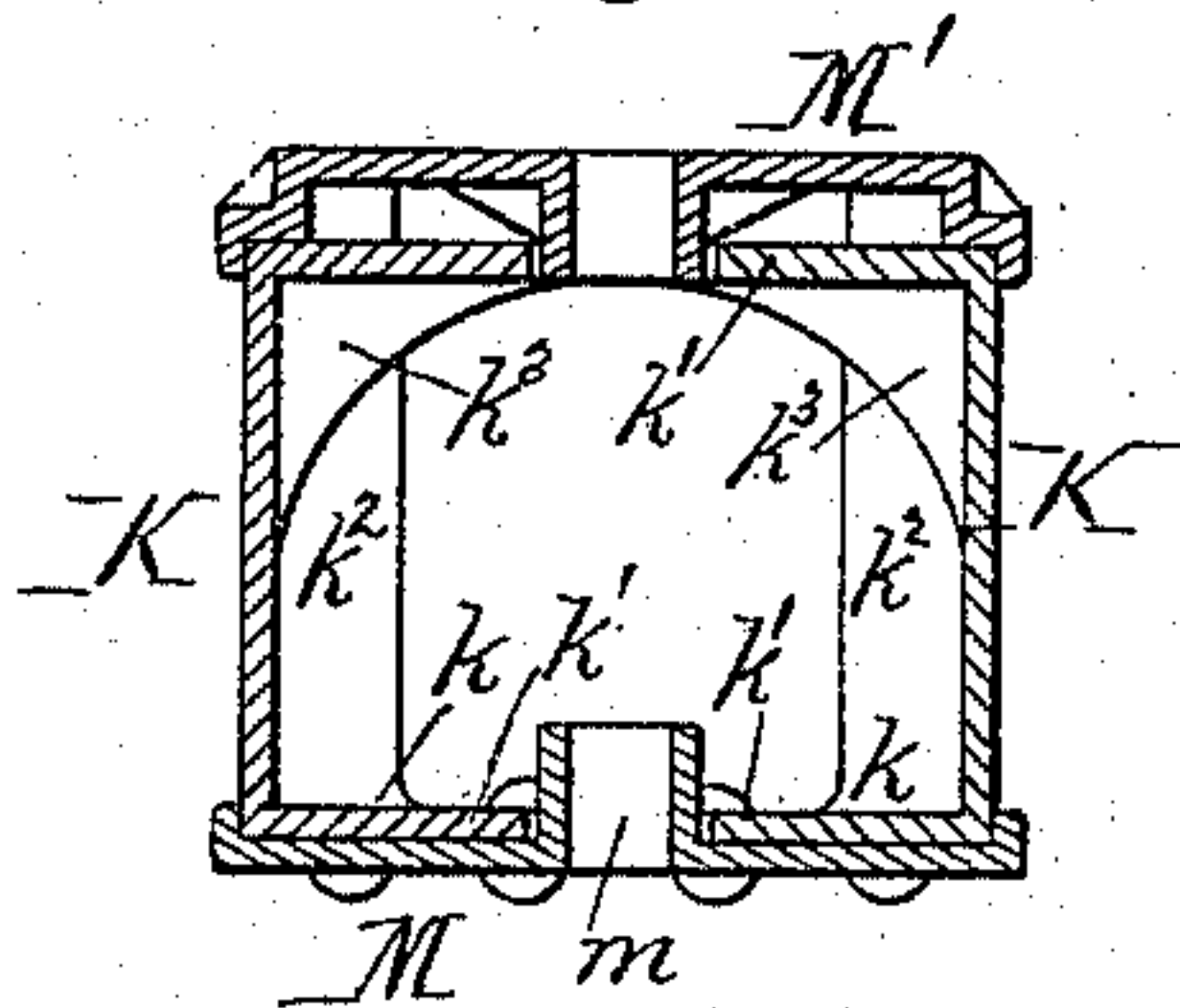


Fig. 8.



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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-TRUCK.

SPECIFICATION forming part of Letters Patent No. 580,534, dated April 13, 1897.

Application filed December 10, 1896. Serial No. 615,209. (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-Trucks, of which the following is a specification.

This invention relates to trucks for freight-cars, and more particularly to metallic car-trucks.

My invention has for its objects to produce a truck of this kind which combines great strength with simplicity and cheapness of construction and which permits a thorough and convenient inspection of the wheels, the brake-gear, and the truck-frame and affords easy access to the brake-gear for renewing brake-shoes and making repairs.

In the accompanying drawings, consisting of three sheets, Figure 1 is a side elevation of my improved truck, partly in section. Fig. 2 is a top plan view thereof. Fig. 3 is a detached elevation of the inner side of one of the side frames of the truck with the tie-bar and the outer jaws of the pedestals removed and showing the adjacent portion of the transom in transverse section. Fig. 4 is a top plan view, partly in section, of said side frame. Fig. 5 is a transverse section of the truck in line 5 5, Fig. 2. Figs. 6 and 7 are fragmentary transverse sections in lines 6 6 and 7 7, Fig. 1. Fig. 8 is a transverse central section of the transom. Fig. 9 is a detached top plan view of one of the transom-bars.

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

A A are the axles, A' the wheels, and A<sup>2</sup> the axle-boxes, which may be of any ordinary construction. The side frames of the truck are constructed of cast metal, such as malleable iron or cast-steel, and each of the same is composed of a substantially rectangular central portion or panel B; pedestals or upright guides B', which receive the axle-boxes A<sup>2</sup>; upper inclined arch-bars B<sup>2</sup>, extending downwardly in opposite directions from the upper corners of the central panel B to the upper portion of the pedestals; lower reversely-inclined arch-bars B<sup>3</sup>, extending upwardly from the lower corners of the central portion B to the pedestals and united

with the adjacent outer portions of the upper arch-bars B<sup>2</sup>, and lower or auxiliary arch-bars B<sup>4</sup>, extending downwardly from the inner ends of the inverted arch-bars B<sup>3</sup> to the lower end of the pedestals. These auxiliary arch-bars are, however, not indispensable and may be omitted, if desired. The several arch-bars are reinforced both on their inner and outer sides by longitudinal stiffening ribs or flanges *b b'*, the ribs *b* of the upper and inverted arch-bars B<sup>2</sup> B<sup>3</sup> being preferably arranged about midway between the edges of the bars and the ribs *b'* of the auxiliary arch-bars B<sup>4</sup> being arranged at the lower edge thereof, as shown in Figs. 1 and 3.

Each side frame is formed at its ends with integral horizontal caps C, which are arranged directly over the axle-boxes A<sup>2</sup> and receive cushioning-springs D, which rest upon the axle-boxes.

E represents a tie-bar which extends across and closes the open lower ends of the pedestals B' and which is secured to the cast-metal side frame by long vertical end bolts *f* and short intermediate bolts *f' f'*<sup>2</sup>. This tie-rod is preferably made of wrought-iron.

The outer jaws B<sup>5</sup> of the pedestals are preferably constructed separate from the cast side frames, so that they can be detached and the axles and their boxes be removed laterally from the pedestals when necessary. These removable pedestal-jaws are secured in place by the vertical end bolts *f*, which pass through flanges *b*<sup>2</sup>, formed at the ends of said jaws, and through flanges or ears *c*, projecting outwardly from the cap C, as shown in Figs. 1, 2, and 6. The holes for the reception of the several bolts *f f' f'*<sup>2</sup> are cast in the side frames and the removable pedestal-jaws, and hence the bolts are not fitted snugly in the holes and are liable to become loose. In order to prevent displacement of the parts, which would be liable to result from the longitudinal jars and vibrations of the truck, the caps C are provided at their outer ends with depending lips *g*, which overlap the upper flanges of the removable pedestal-jaws B<sup>5</sup>, and the tie-bar E is provided at its ends with similar upwardly-projecting lips *h*, which overlap the lower ends of said removable jaws, as shown in Fig. 1. These



lips relieve the several bolts from the end thrust to which they would otherwise be subjected and insure a tight fit of the parts. In order to relieve these bolts from the side thrust due to the lateral vibrations of the truck, the removable pedestal-jaws  $B^5$  are provided at their upper ends on opposite sides with upwardly-projecting lips  $i$ , which overlap the sides of the cap-ears  $c$ , and at their lower ends with similar lips  $i'$ , which overlap the edges of the tie-bar  $E$ , as shown in Figs. 1 and 6. For the same purpose the side frame is formed near its ends and at its middle with similar depending lips  $j$   $j'$ , which overlap the edges of the tie-bar, as shown in Figs. 1 and 5. The middle lips  $j'$  are formed on a downward extension  $j^2$  of the side frame, through the lower flange of which extension the central bolt  $f^2$  passes.

The upper and auxiliary arch-bars  $B^2$  and  $B^4$  are subjected to compression strain and the lower inverted arch-bars  $B^3$  to tensile strain, and these several bars correspond to the upper and auxiliary arch-bars and inverted arch-bars of the well-known "diamond" truck. The side frames are thus built upon the approved lines of the diamond truck, and while possessing the superior strength of that truck are much simpler in construction and can be produced at much less expense, as they are cast in a single piece and require no special machinery for their manufacture. The several inclined or converging arch-bars of the side frame are separated by intervening spaces or apertures, through which the adjacent portions of the wheel flanges and treads and the brake-gear are exposed, permitting an easy and thorough inspection of these parts and the truck-frame and rendering the brake-shoes, the hangers, and connecting parts of the brake-gear conveniently accessible for making repairs and renewing the brake-shoes.

The transom or beam which connects the side frames of the truck preferably consists of two parallel channel-bars  $K$   $K$ , of cast metal, arranged so that the horizontal flanges  $k$  of the bars face each other. These bars are seated at their ends in rectangular pockets or sockets  $L$ , projecting inwardly from the middle portions of the side frames and cast in one piece with the frames, and the bars are secured in these pockets by rivets or bolts  $l$ , passing through the flanges of the bars and the upper and lower walls of the pockets. These pockets sustain the load resting on the transom, and the rivets  $l$  simply serve to retain the ends of the transom in the pockets. By this construction the rivets are relieved from vertical shearing strains, and a smaller number of rivets can be employed than in a construction where the transom is provided at its ends with vertical flanges through which the rivets pass. Each transom-bar is provided on its inner side with diagonal reinforcing ribs or flanges  $k^3$ , which extend from the middle portion of the upper flange to the

outer ends of the lower flange, and the wing of the upper flange is stiffened by transverse ribs or flanges  $k^3$ . By this construction the transom can be made comparatively narrow, so that it occupies less space and leaves more room for the brake-gear.

$M$  is a tie-plate which connects the lower middle portions of the transom-bars  $K$  and which is provided with a central opening  $m$  for the passage of the usual king-bolt.  $M'$  is a similar plate connecting the upper middle portion of the transom-bars and forming the center or base plate of the truck, upon which the center plate of the car-body rests. The upper flanges  $k$  of the transom-bars are widened or formed with inwardly-extending wings  $k'$  at their middle, as shown in Fig. 9, which wings form wide supports for the center plate  $M'$ .

I claim as my invention—

1. A side frame for car-trucks formed of a single piece of cast metal and composed of a central portion or panel, upper inclined arch-bars extending downwardly and outwardly from the upper portion of the panel, lower reversely-inclined arch-bars extending upwardly and outwardly from the lower portion of the panel, horizontal caps arranged at the outer ends of said arch-bars, inner pedestal-jaws extending downwardly from the outer meeting ends of said upper and lower arch-bars and auxiliary arch-bars extending downwardly from the inner ends of said lower arch-bars to the lower ends of said pedestal-jaws, substantially as set forth.

2. A side frame for car-trucks, composed of a central portion or panel, pedestals arranged at the ends of the frame, upper inclined arch-bars extending from the upper portion of said central panel to the pedestals, lower reversely-inclined arch-bars extending from the lower portion of said central panel to the pedestals, horizontal caps arranged at the ends of the frame above said pedestals and adapted to receive the cushioning-springs of the truck, and a tie-bar connecting the lower ends of said pedestals, substantially as set forth.

3. In a car-truck, the combination with a side frame formed of a single piece of cast metal and composed of a central portion or panel, pedestals arranged at the ends of the frame, and upper and lower arch-bars connecting the pedestals with said central panel and converging toward the pedestals, of a tie-bar connecting the lower ends of the pedestals and provided at its ends with lips which overlap the lower ends of the pedestals, substantially as set forth.

4. In a car-truck, the combination with a side frame formed of a single piece of cast metal and composed of a central portion or panel, pedestals arranged at the ends of the frame and upper and lower arch-bars connecting the pedestals with said central panel and converging toward the pedestals, of a tie-bar connecting the lower ends of the pedestals,



the side frame being provided at its lower edge with lateral lips which overlap the edges of the tie-bar, substantially as set forth.

5 In a car-truck, the combination with a side frame formed of a single piece of cast metal, and composed of a central portion or panel, pedestals arranged at the ends of the frame, and upper and lower arch-bars connecting said central panel with said pedestals, said pedestals having removable outer jaws provided at their ends with lateral lips, of a tie-bar connecting the lower ends of said pedestals, the lips of the removable pedestal-jaws overlapping the sides of the side frame 15 and the edges of the tie-bar, respectively, substantially as set forth.

6. In a car-truck, the combination with a side frame formed of a single piece of cast metal and composed of a central portion or panel, pedestals arranged at the ends of the frame and upper and lower arch-bars connecting said central panel with said pedestals, said pedestals having removable outer jaws provided at their ends with lateral lips, of a tie- 25 bar connecting the lower ends of said pedestals and provided at its ends with lips which overlap the lower ends of said removable pedestal-jaws, the lips of said jaws overlapping the sides of the frame and the edges of the tie-bar, and the frame being provided at its ends with lips which overlap the upper ends of said jaws, substantially as set forth. 30

7. The combination with a pair of side frames each formed of a single piece of cast metal and composed of a central horizontal pocket or socket, pedestals arranged at the ends of the frame, upper inclined arch-bars extending from the upper portion of said pocket to said pedestals, and lower oppositely- 40 inclined arch-bars extending from the lower

portion of said pocket to the pedestals, of a transom having its ends seated in the central pockets of the side frames, substantially as set forth.

8. The combination with a pair of side 45 frames each formed of a single piece of cast metal and composed of a central horizontal pocket or socket, pedestals arranged at the ends of the frame, upper inclined arch-bars extending from the upper portion of said 50 pocket to said pedestals, and lower oppositely-inclined arch-bars extending from the lower portion of said pocket to the pedestals, of a tie-bar connecting the lower ends of said pedestals, and a cast-metal transom having its 55 ends seated in the central pockets of the side frames and secured therein, substantially as set forth.

9. The combination with the side frames of the truck, of a transom composed of a pair 60 of parallel cast-metal bars each having inwardly-facing flanges and provided on opposite sides with oblique stiffening-ribs extending from the middle thereof, toward its ends, substantially as set forth. 65

10. The combination with the side frames of a truck, of a transom composed of a pair of parallel cast-metal bars, each provided at its upper edge with an inwardly-facing flange provided at its middle with a widened por- 70 tion or wing, said wings forming supports for the center plate of the truck, substantially as set forth.

Witness my hand this 7th day of December, 1896.

WILLARD F. RICHARDS.

Witnesses:

JNO. J. BONNER,  
CARL F. GEYER.