

No. 705,763.

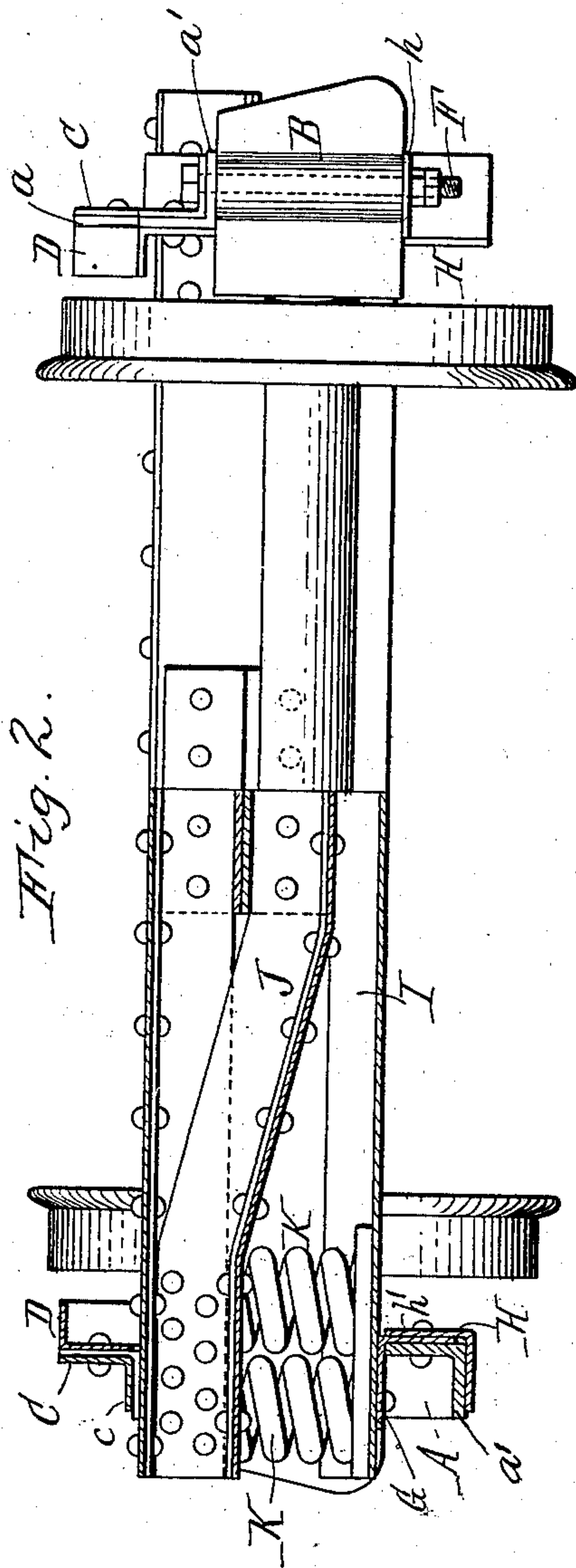
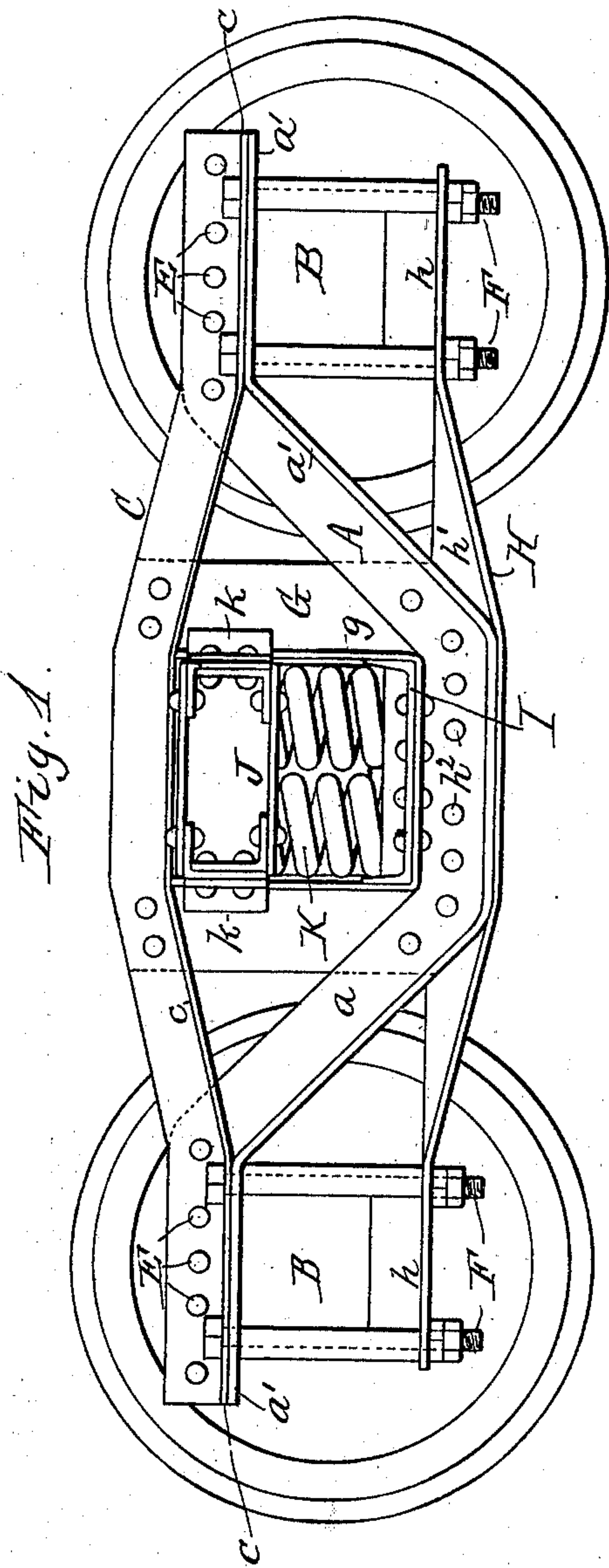
Patented July 29, 1902.

H. R. KEITHLEY.
RAILWAY CAR TRUCK.

(Application filed May 21, 1902.)

(No Model.)

2 Sheets—Sheet 1.



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2 Sheets—Sheet 2.

Fig. 3.

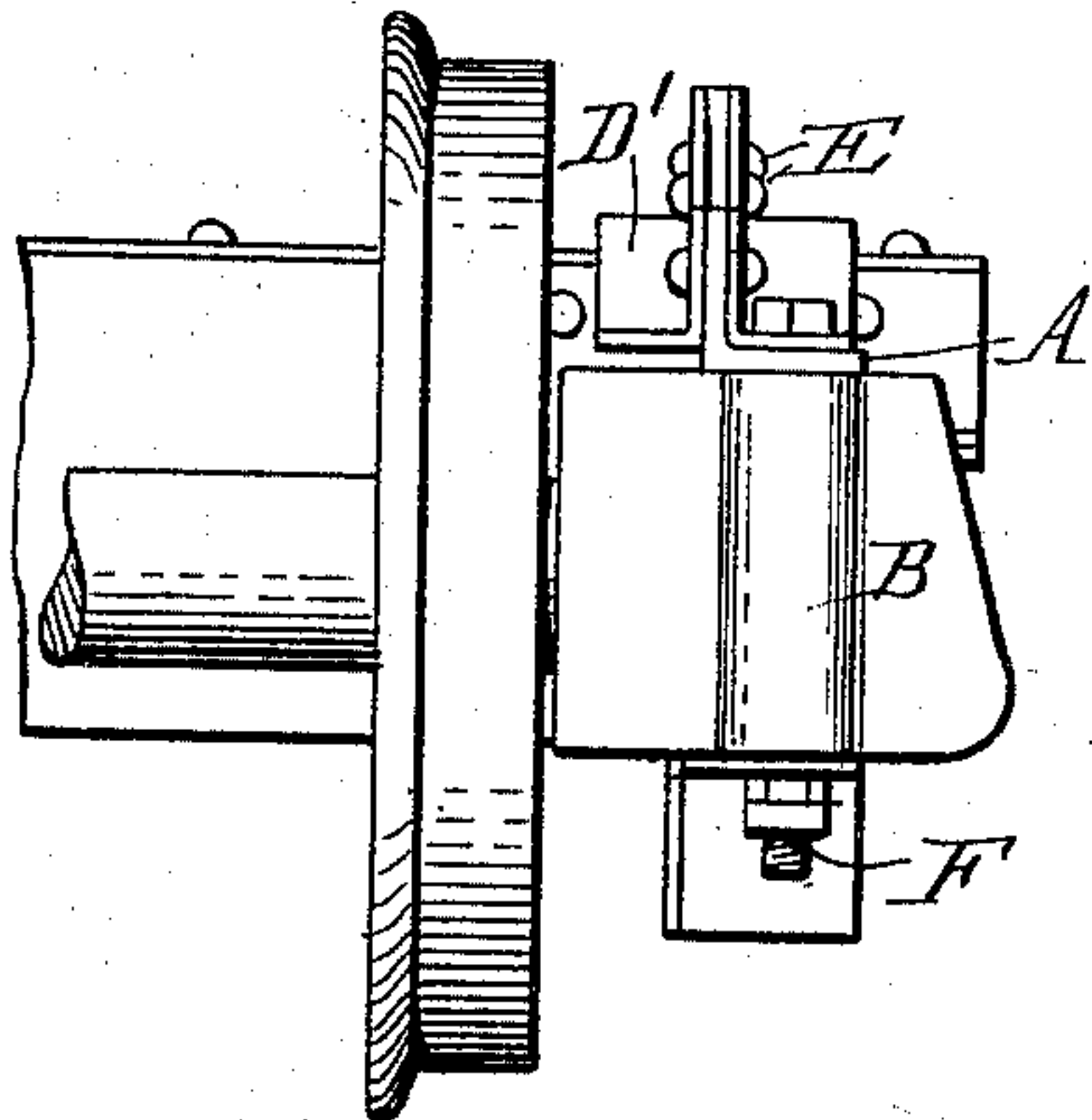


Fig. 4.

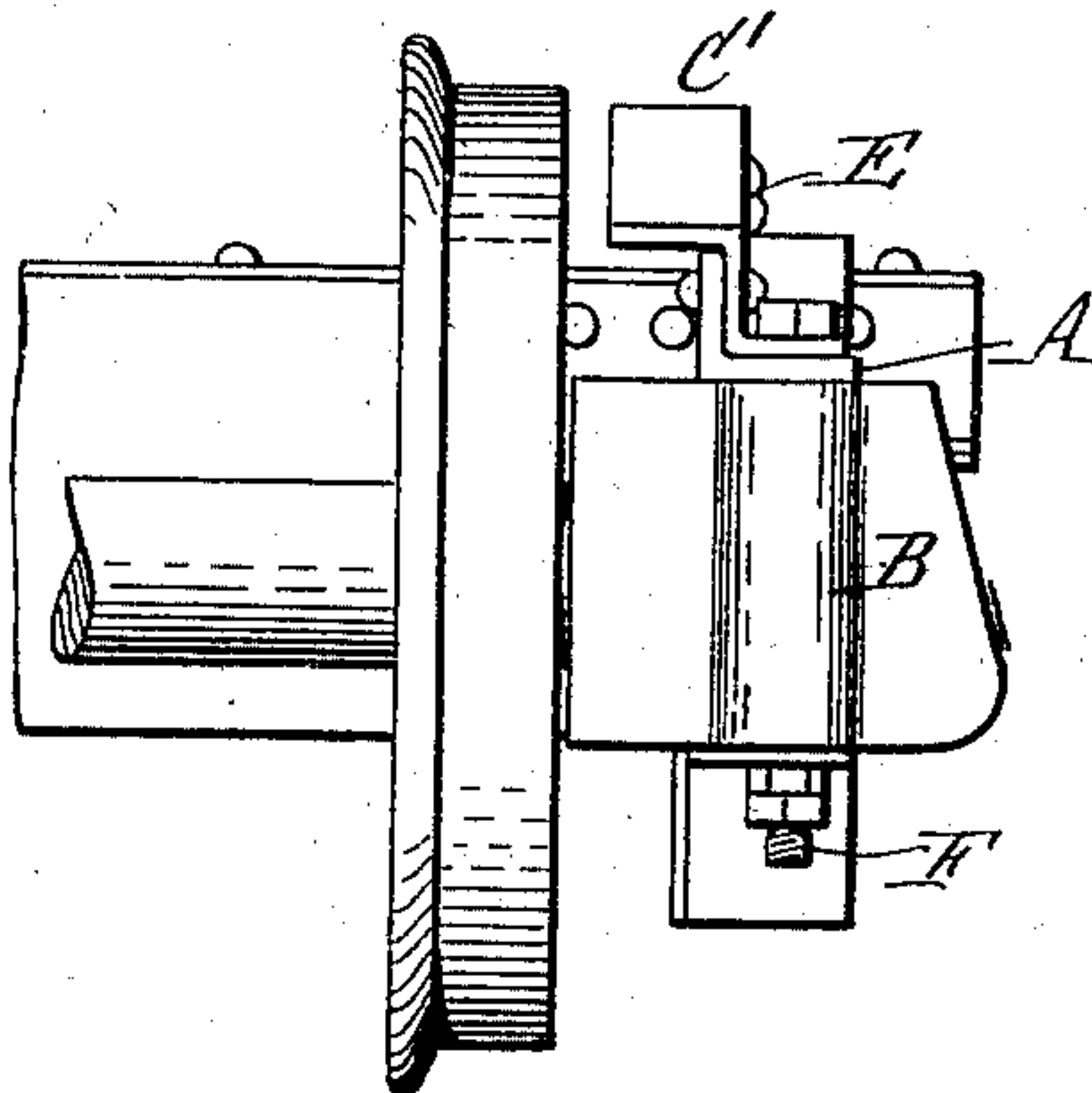


Fig. 5.

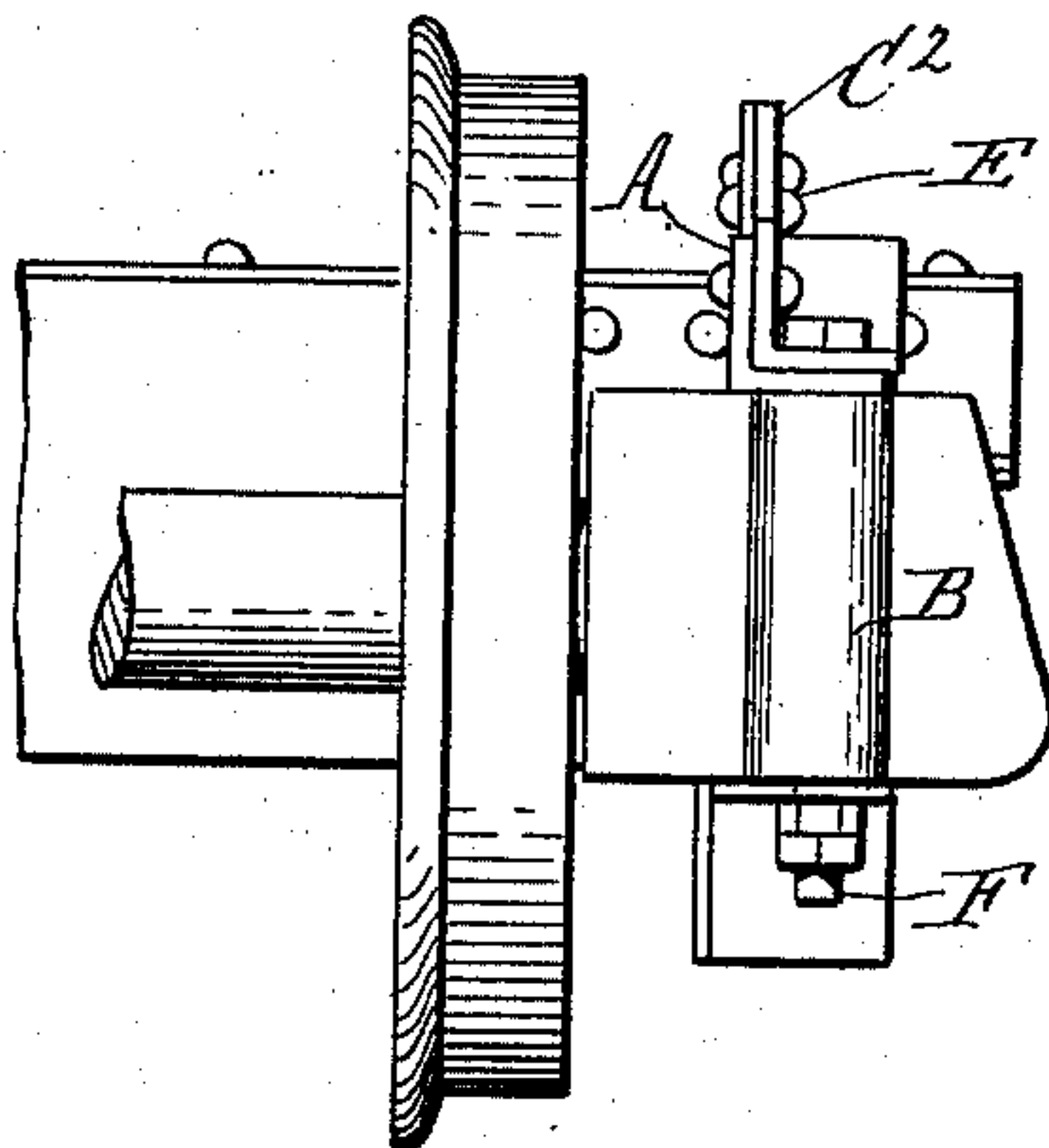
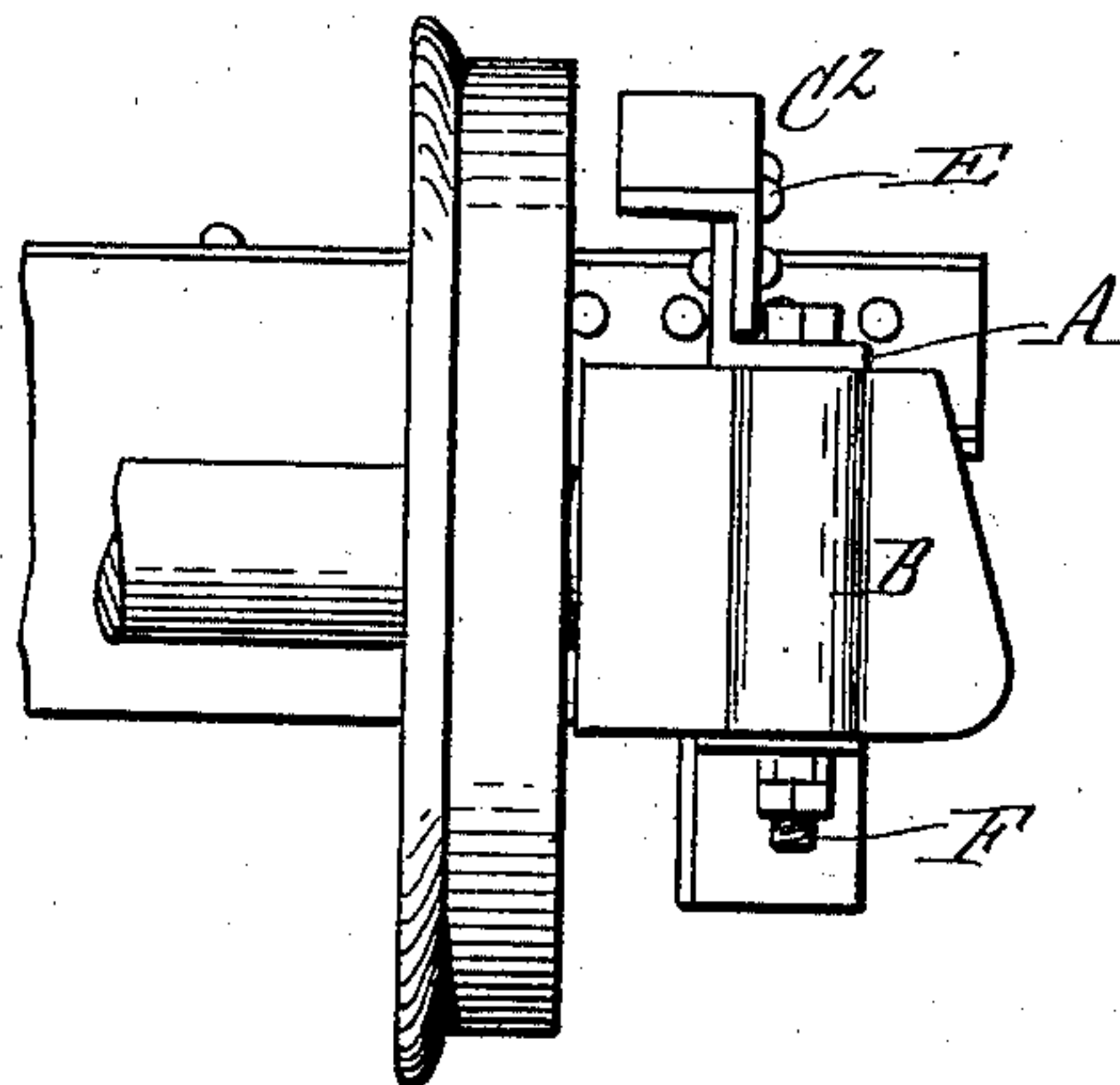


Fig. 6.



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UNITED STATES PATENT OFFICE.

HERBERT R. KEITHLEY, OF BUFFALO, NEW YORK.

RAILWAY-CAR TRUCK.

SPECIFICATION forming part of Letters Patent No. 705,763, dated July 29, 1902.

Application filed May 21, 1902. Serial No. 108,377. (No model.)

To all whom it may concern:

Be it known that I, HERBERT R. KEITHLEY, 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 Railway-Car Trucks, of which the following is a specification.

This invention relates more particularly to a railway-car truck of that type known as the "diamond" truck.

In diamond trucks of ordinary construction the horizontal end portions of the upper and lower chords of the side frames consist of flat rolled bars connected together and to the axle-boxes by but two vertical bolts, which receive all of the shearing strain. With continued usage under heavy loads these bolts become worn or bent from such shearing strains, causing a permanent "set" or downward deflection of the side frames. It has been proposed to make the side frames of pressed steel or pressed-steel parts; but the pressed-steel constructions are expensive and are objected to by engineers on account of the distortion of the parts due to strains in the metal resulting from the pressing operations.

The object of the present invention is to provide a diamond truck of maximum strength, rigidity, and durability having its side frames built up of rolled flanged shapes riveted together and disposed to the best advantage to relieve the anchoring-bolts at the axle-boxes of all shear, and thereby preventing any set or downward deflection of the truck side frames.

In the accompanying drawings, consisting of two sheets, Figure 1 is a side elevation of a railway-car truck embodying the invention. Fig. 2 is a view thereof one-half in end elevation and one-half in central vertical section. Fig. 3 is a fragmentary end view showing a slightly-modified construction of the side frame. Figs. 4, 5, and 6 are similar views showing still other constructions of the side frame.

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

The truck-frame comprises two trussed side frames connected by a transverse member or spring-board, the side frame being composed of upper and lower chords rigidly

attached at their ends to the axle-boxes and securely riveted to each other.

In the form of the invention shown in Figs. 1 and 2 the lower chord A is formed of an angle-bar arranged with one flange or portion *a* standing vertically and the other flange *a'* projecting laterally from the lower edge of the vertical flange. The end portions of the lower chord are horizontal and rest on the tops of the axle-boxes B, and the central portion of the lower chord is depressed or bent downwardly between the axle-boxes, as usual. The upper chord is composed of two angle-bars C and D, each arranged with one flange or portion standing vertically and one flange projecting laterally. The horizontal flange *c* of the angle-bar C at the ends of the bar rests upon the horizontal end portions of the lateral flange *a* of the lower chord, while the ends of its other flange stand vertically beside the ends of the vertical flange *a'* of the lower chord. The lateral flange of the other angle-bar D of the upper chord projects in a direction opposite to that of the lateral flange of the angle-bar C of the upper chord and preferably from the upper edge of its vertical flange. The angle-bar D of the upper chord may, however, be reversed, so that its lateral flange projects from the lower edge of the vertical flange. This construction is illustrated at D', Fig. 3 of the drawings. The angle-bars forming the upper and lower chords are connected rigidly together at their ends by horizontal rivets E, which pass through the vertical flanges or portions of the several angle-bars. The upper and lower chords are also connected together and rigidly fixed to the axle-boxes by the usual vertical anchoring-bolts F, which extend through the horizontal superposed flanges of the upper and lower chords and through the usual bolt-holes provided on the sides of the axle-boxes.

The horizontal rivets connecting the vertical flanges or portions of the chords take practically all of the horizontal shear in the connected ends of the truss-chords due to the opposing tension and compression stresses. These rivets, owing to the described formation of the upper chord of two angle-bars, are placed in double shear, and their effectiveness is thus doubled. The vertical anchoring-bolts

are practically relieved by the rivets of all shear, and as the bolts pass through the horizontal flanges of both the upper and lower chords the connection of the frame with the boxes is greatly strengthened. The vertical bolts are not, therefore, liable to become bent or worn and cause a permanent set or downward deflection of the side frame, which is so common in ordinary forms of diamond trucks.

The central separated portions of the upper and lower chords are connected rigidly and held spaced apart by a vertical substantially U-shaped member G, which in the construction shown is in the form of an angle-bar arranged with one flange vertical and riveted at its lower part to the lower chord and at its upper part to the vertical flanges or portions of the two angle-bars constituting the upper chord. The lateral flange g of the member G projects outwardly from the inner edge of its vertical flange. The side frame is completed by a tie-bar H, which, as shown, is formed of an angle-bar having the ends of its horizontal flange h extending beneath the axle-boxes and secured thereto by the vertical anchoring-bolts F and the central portion of its vertical flange h' secured to the vertical flanges of the lower chord and U-shaped connecting member G by the rivets h², which connect the chord and connecting member together. The end portions of the vertical flange of the tie-bar are sheared off to permit the ends of the horizontal flange to project beneath the axle-box, as described.

In Fig. 4 is shown a slightly-modified form of the side frame in which the upper chord C' is formed of a Z-bar instead of two angle-bars. The Z-bar is arranged with its web or body portion vertical and riveted at the ends thereof to the end portions of the vertical flange or portion of the lower chord and with the ends of its lower flange over and resting on the end portions of the horizontal flange of the lower chord. This construction also affords the double thickness of metal for the vertical anchoring-bolts and a large riveting area for the horizontal rivets connecting the ends of the chords.

In Figs. 5 and 6 is illustrated a construction in which the upper chord C² is formed of a single angle-bar which is preferably of greater metal section than either of the angle-bars employed in the upper chord shown in Figs. 1 and 2, being substantially equal to that of the angle-bar forming the lower chord. While in this form of the invention and that disclosed in Fig. 4 and just above described the horizontal rivets connecting the ends of the chord are not placed in double shear, the advantage of fewer parts is secured and a more desirable truck provided.

The two side frames of the truck are rigidly connected by a transverse member or spring-board I, the ends of which pass through the spaces formed in the side frames between the upper and lower chords and the sides of the vertical connecting members and rest on

the horizontal portions of the lateral flanges of the latter, to which the end of the spring-board is riveted. A spring-board of channel form is shown.

J represents the truck-bolster, which may be of any suitable form and is supported, as usual, above the spring-board by springs K, resting on the ends of the spring-board or spring-plates supported thereby and engaging beneath the ends of the bolster. The ends of the bolster project out through the spaces formed in the side frames between the upper and lower chords and the vertical sides of the U-shaped connecting members G, and the bolster is guided in its vertical movement and held from longitudinal displacement by guide-plates k, which are riveted to the sides of the bolster at the inner and outer sides of the vertical U-shaped connecting members. These guide-plates hold the upper parts of the side frames from deflection toward or from each other.

In all of the constructions shown and described the preferable arrangement of the flanged bars of the upper and lower chords of the side frames is such as to provide two horizontal flanges or portions through which the anchoring-bolts pass and two or more vertical flanges or portions for the rivets connecting the ends of the chords together; but this construction may be modified—for instance, as shown in Fig. 6—without departing from the scope of my invention.

I claim as my invention—

1. In a diamond truck, the combination of axle-boxes, of a side frame composed of an upper and a lower chord, said lower chord having a horizontal flange and a vertical portion, the ends of said upper chord being riveted to the vertical portion of said lower chord, and vertical anchoring-bolts connecting said horizontal flange of the lower chord to said axle-boxes, substantially as set forth.
2. In a diamond truck, the combination with axle-boxes, of a side frame composed of an upper and a lower chord, said upper chord having a horizontal flange and a vertical portion, the ends of said lower chord being riveted to the vertical portion of said upper chord, and vertical anchoring-bolts connecting said horizontal flange of the lower chord to said axle-boxes, substantially as set forth.
3. In a diamond truck, the combination with axle-boxes, of a side frame composed of an upper chord and a lower chord, each having a horizontal flange and a vertical portion, the ends of said horizontal flanges being superposed and the ends of said vertical portions being riveted together, and vertical anchoring-bolts connecting said horizontal flanges to said axle-boxes, substantially as set forth.
4. In a diamond truck the combination with axle-boxes, of a side frame composed of an upper chord and a lower chord each comprising an angle-bar having a horizontal flange and a vertical flange, the ends of said

horizontal flanges being superposed and the ends of said vertical flanges being riveted together, and vertical bolts connecting said horizontal flanges to said axle-boxes, substantially as set forth.

5. In a diamond truck, the combination with axle-boxes, of a side frame composed of an upper and a lower chord, one of said chords having a horizontal flange and a vertical flange, said other chord comprising two angle-bars each arranged with one flange vertical and one flange extending laterally from the vertical flange, the ends of the vertical flanges of the angle-bars of one chord being riveted to the ends of the vertical flanges of said other chord, and vertical bolts connecting the horizontal flange of one of said chords to said axle-boxes, substantially as set forth.

6. In a diamond truck, the combination with axle-boxes, of a side frame composed of an upper and a lower chord, said lower chord having a horizontal flange and a vertical flange, said upper chord comprising two angle-bars each arranged with one flange vertical and one flange extending laterally from the vertical flange, the ends of the vertical flanges of the angle-bars of the upper chord being riveted to the ends of the vertical flange of said lower chord, and vertical bolts connecting the horizontal flanges of said lower chord to said axle-boxes, substantially as set forth.

7. In a diamond truck, the combination with axle-boxes, of a side frame composed of an upper and a lower chord, said lower chord having a horizontal flange and a vertical portion, the ends of said upper chord being riv-

eted to the vertical portion of said lower chord, vertical bolts connecting said horizontal flange of said lower chord to said axle-boxes, and a substantially U-shaped bar connecting said upper and lower chords between the axle-boxes, substantially as set forth.

8. In a diamond truck, the combination with axle-boxes, of a side frame composed of an upper and a lower chord, said lower chord having a horizontal flange and a vertical portion, the ends of said upper chord being riveted to the vertical portion of said lower chord, vertical bolts connecting said horizontal flange of said lower chord to said axle-boxes, a substantially U-shaped member connecting said chords between the axle-boxes and a tie-bar connected at its ends to said axle-boxes and at its central portion to said lower chord, substantially as set forth.

9. In a diamond truck, the combination with axle-boxes, of two side frames each composed of an upper and a lower chord, said lower chord having a horizontal flange and a vertical portion, the ends of said upper chord being riveted to the ends of the vertical portion of said lower chord, vertical bolts connecting said horizontal flanges of the lower chords to said axle-boxes, and a spring-board connecting said side frames, substantially as set forth.

Witness my hand this 17th day of May, 1902.

HERBERT R. KEITHLEY.

Witnesses:

CHAS. W. PARKER,

CLAUDIA M. BENTLEY.