No. 731,626. PATENTED JUNE 23, 1903.

G. H. SHEFFIELD & J. D. TWINBERROW.

BOGIE FOR RAILWAY CARS.

APPLICATION FILED OCT. 19, 1901.

NO MODEL. 5 SHEETS—SHEET 1.

Fig. 1.

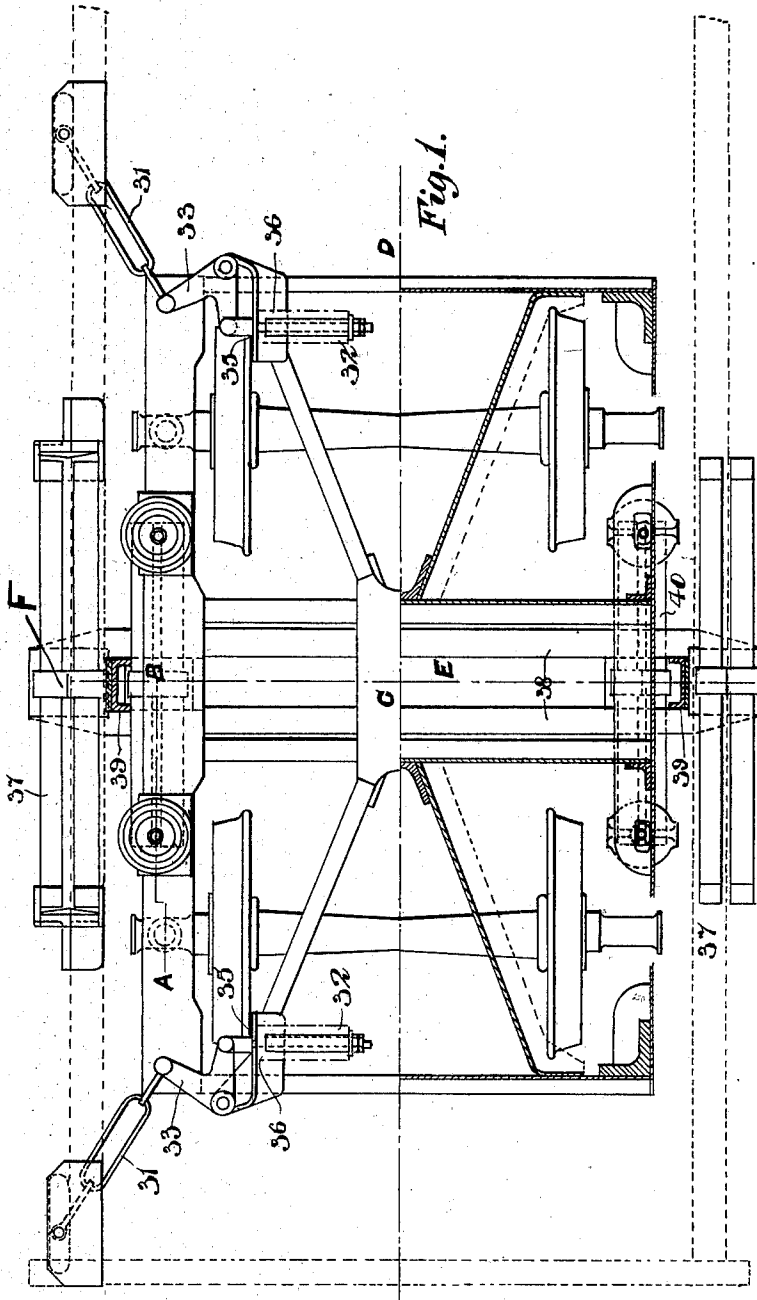
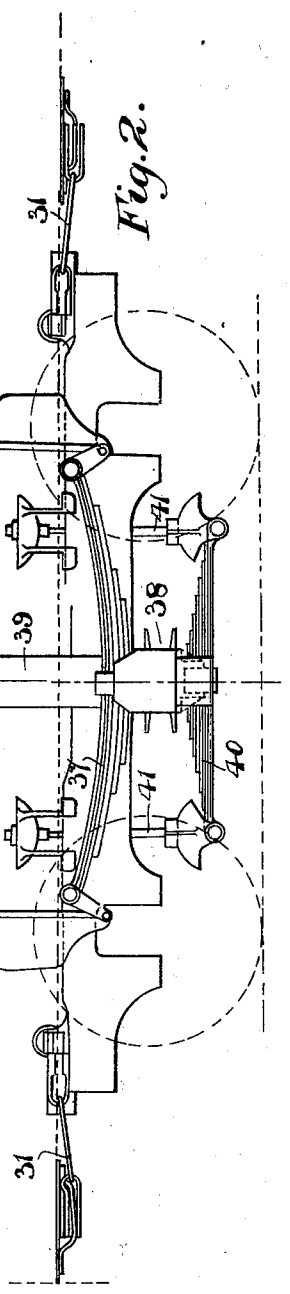



Fig. 2.




Attest:

Inventors.
George H. Sheffield
James D. Twinberrow

by Richards & Co Attys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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NO MODEL. 5 SHEETS—SHEET 2.

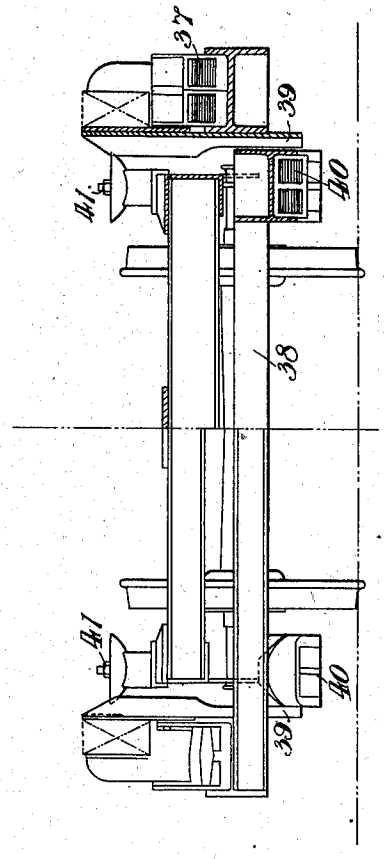



Fig. 4.

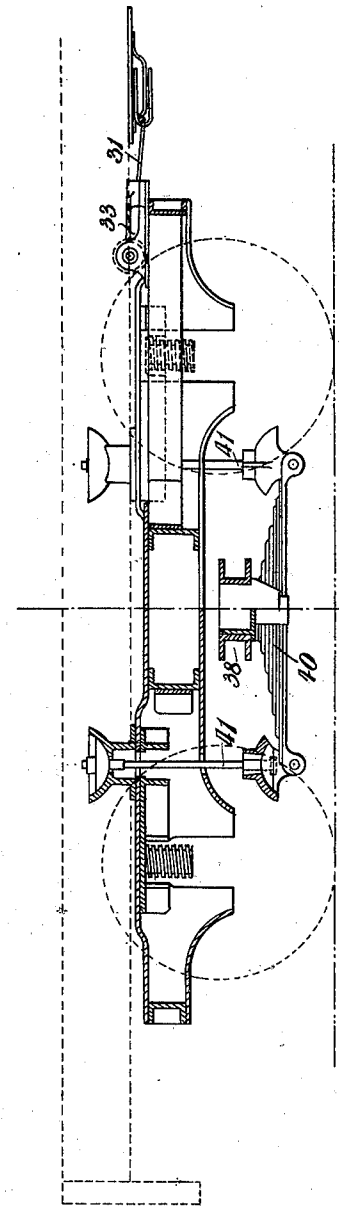



Fig. 3.

Attest:
C. Middleton
Walter D. Davidson

Inventors
George H. Sheffield
James D. Twinberrow
by Richards & Lee Atty's.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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NO MODEL. 5 SHEETS—SHEET 3.

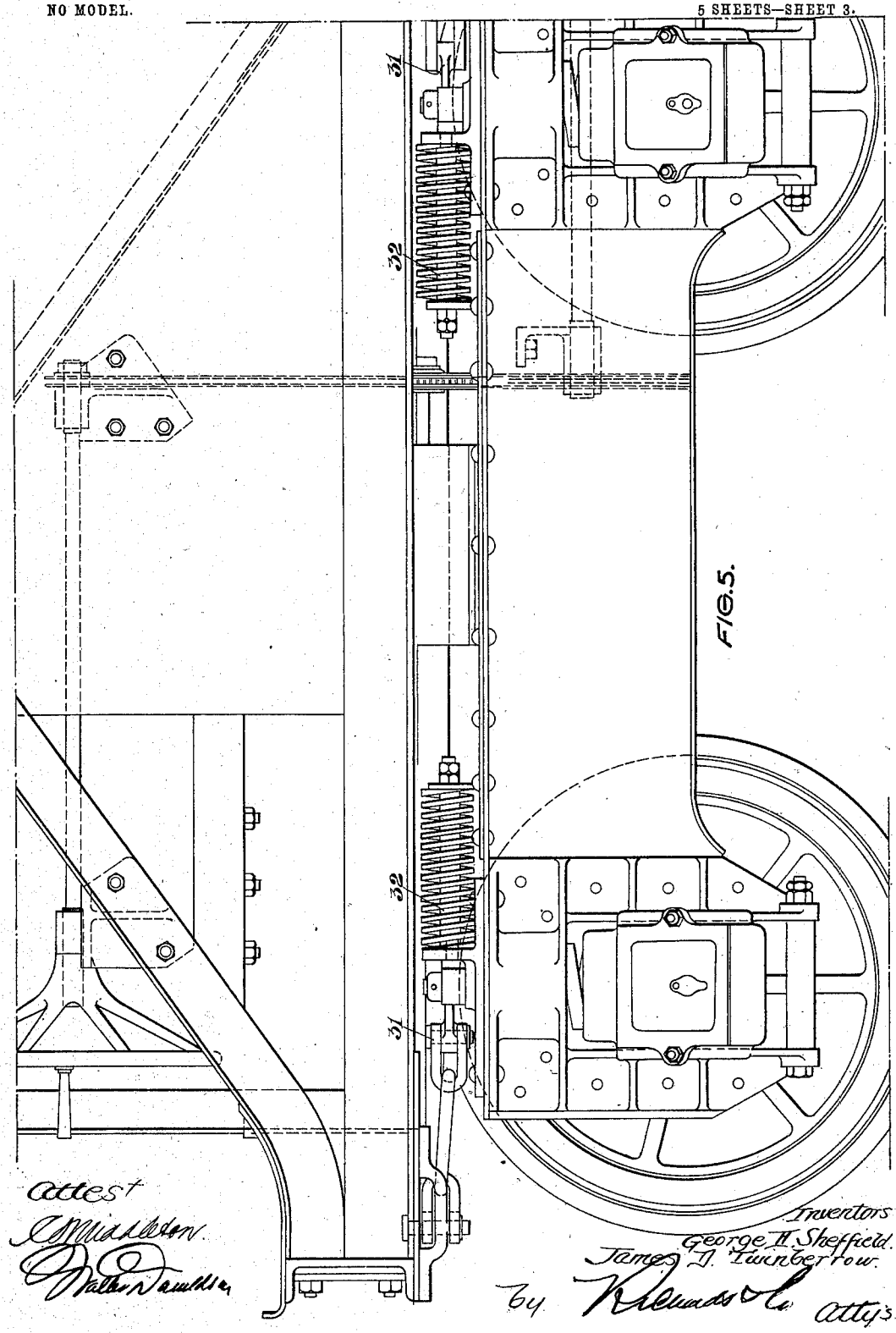



FIG. 5.

Attest
C. Middleton
Walter Dawdell

Inventors
George H. Sheffield.
James D. Twinberrow.
by Richards & Co. atty's

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 731,626. PATENTED JUNE 23, 1903.

G. H. SHEFFIELD & J. D. TWINBERROW.

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NO MODEL. 5 SHEETS—SHEET 4.

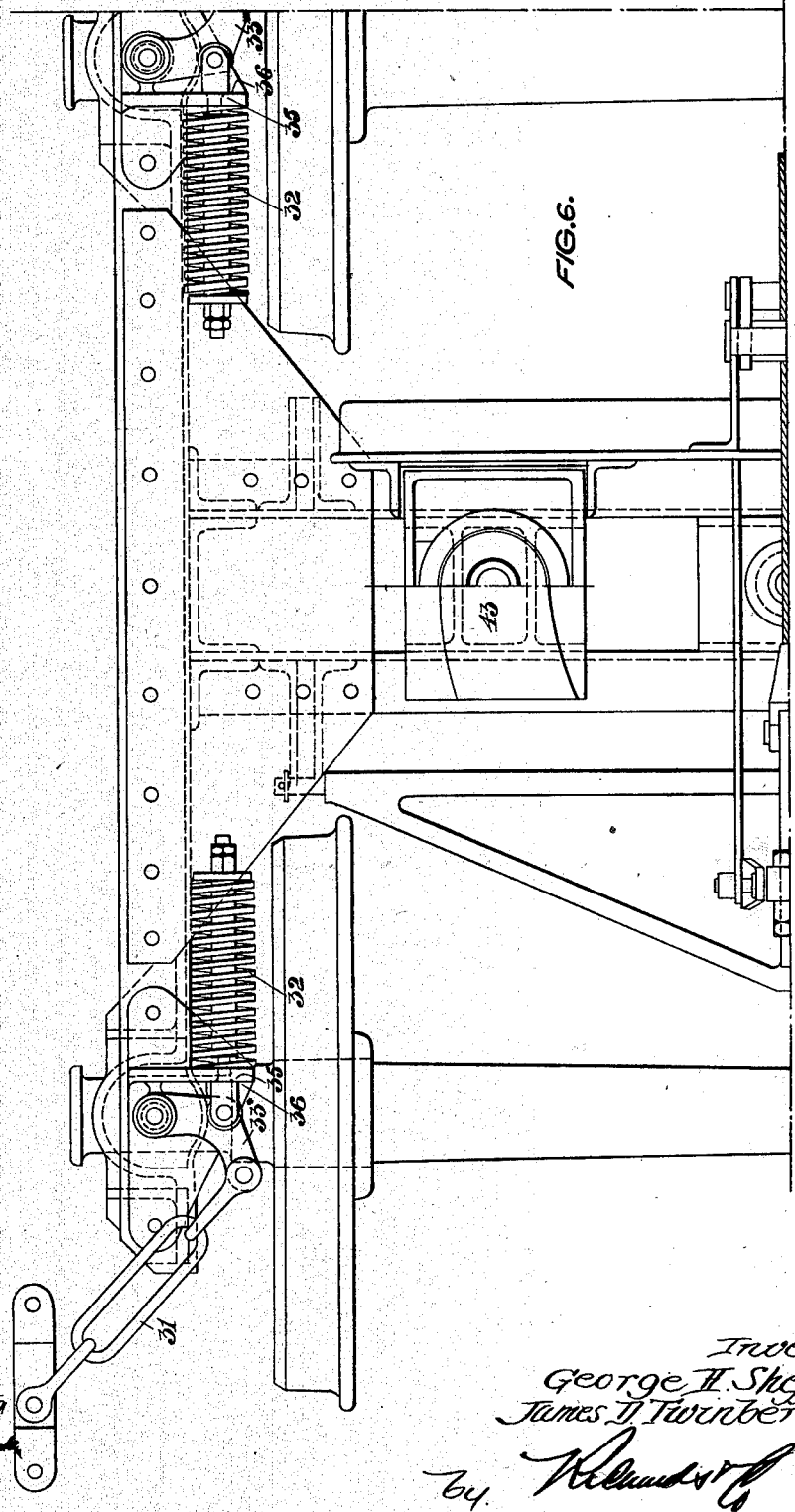



FIG. 6.

Attest.
Edward Lofton
Wm. D. Dodge

Inventors.
George H. Sheffield
James D. Twinberrow.
By Williamson & Co.
Atty's

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 731,626. PATENTED JUNE 23, 1903.

G. H. SHEFFIELD & J. D. TWINBERROW.

BOGIE FOR RAILWAY CARS.

APPLICATION FILED OCT. 19, 1901.

NO MODEL. 5 SHEETS—SHEET 5.

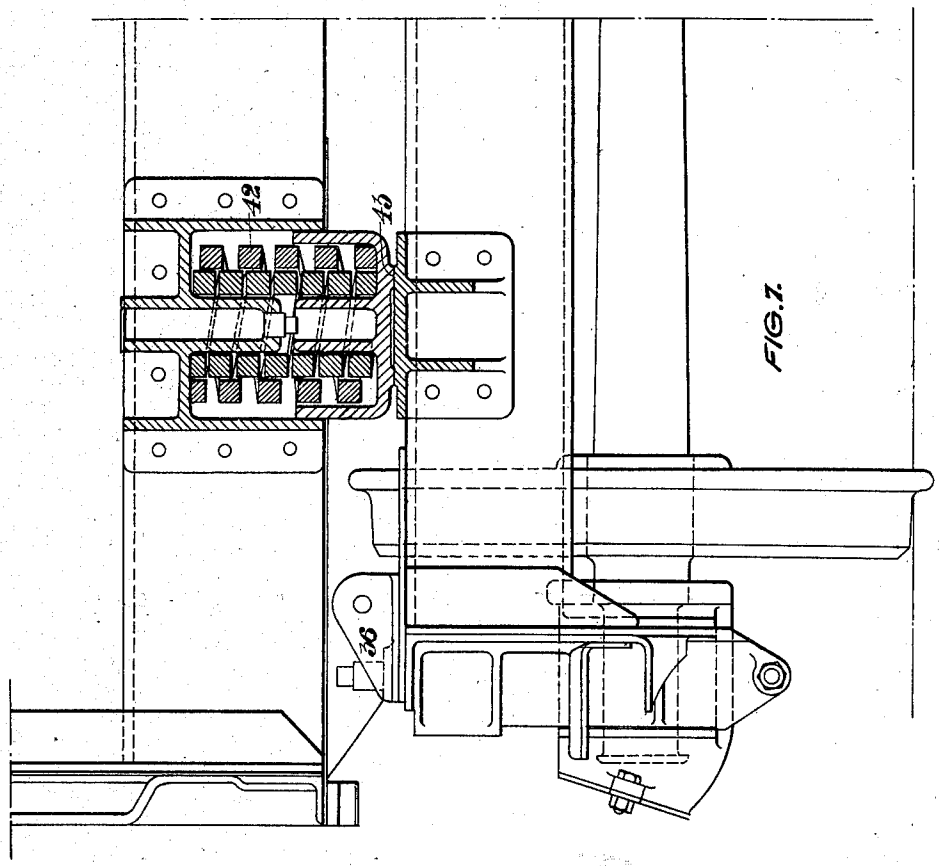



FIG. 7.

Attest:

Inventors.
George H. Sheffield.
James D. Twinberrow.
By Kelly & Co
Atty's.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 731,626. Patented June 23, 1903.

# UNITED STATES PATENT OFFICE.

GEORGE H. SHEFFIELD AND JAMES D. TWINBERROW, OF NEWCASTLE-UPON-TYNE, ENGLAND.

## BOGIE FOR RAILWAY-CARS.

SPECIFICATION forming part of Letters Patent No. 731,626, dated June 23, 1903.

Application filed October 19, 1901. Serial No. 79,300. (No model.)

*To all whom it may concern:*

Be it known that we, GEORGE H. SHEFFIELD and JAMES D. TWINBERROW, civil engineers, subjects of the King of Great Britain and Ireland, residing at 13 Mosley street, Newcastle-upon-Tyne, in the county of Northumberland, England, have invented certain new and useful Improvements in and Connected with Bogies for Railway-Cars or Freight-Vehicles, (for which we have made application for Letters Patent in Germany, application filed March 21, 1901,) of which the following is a specification.

This invention relates to improvements in railway-bogies for passenger or freight cars, and has for its object to lessen the transmission of vibration from the bogie to the car-body, while at the same time allowing the bogie to move freely both laterally and vertically in order to adapt itself to curves or inequalities in the permanent way, and to apply a directive force to the bogie tending to keep it in its normal position and to return it promptly thereto when the force causing deflection ceases to act.

The invention consists in the provision of elastic and flexible connections between the bogie and the car-frame in addition to or in place of the ordinary center pin and bearing-plates, such flexible connections being applied at each of the four corners of the bogie-frame and being preferably in the form of chains or shackles directly connected to the car-body, but elastically connected to the bogie-frame, preferably through the medium of pivoted levers, the movements of which are controlled by springs adjusted to always keep the chains in tension, but adapted to yield to the stress in the links occasioned by any relative movement between the car-body and the bogie.

In the accompanying drawings, Figures 1 to 4 illustrate the application of the invention to a passenger-car, while Figs. 5 to 7 illustrate the application to a freight-car. Fig. 1 is a half-sectional plan. Fig. 2 is a side elevation. Fig. 3 is a half-sectional elevation on the lines A B C D, Fig. 1. Fig. 4 is a half-sectional end elevation on the line E F, Fig. 1. Figs. 5, 6, and 7 are respectively side elevation half-plan, and half-sectional end elevation.

In applying the invention to a passenger-car in one convenient manner the bogie is connected to the car-sill by radial chain links and shackles 31. Each of the shackles is secured at one end to a bracket on the car-sill and at the other end to one arm of a bell-crank lever 33, pivoted on a bracket 36 attached to the bogie-frame. The other arm of each lever 33 is controlled by a coiled spring 32, adjusted to maintain each of the shackles 31 in tension, the spring 32, however, yielding to the stress in the links 31 occasioned by any relative movement between the bogie and car-body. Angular motion in a horizontal plane necessitates an equal yielding of all the springs, but a lateral impact or other externally-applied force—as, for example, a pull of the brake-rods—is resisted only by those links the inclination of which have a component in a direction opposite to the line of action of the applied force. In order to prevent the spring which acts on the links that are inclined toward that line of action from assisting or increasing the resulting deflection of the bogie, truck-shoulders 35 are provided on the spring-spindles, which shoulders abut against the fixed brackets 36 and prevent the springs from elongating when they are set up under initial compression.

The passenger-car body is supported by groups of springs 37, which rest on the ends of the beam 38, guided by vertical members 39, attached to the main frame and supported by the inverted springs 40, which are suspended from the bogie-frame by links 41. The latter are provided with spherical bearings to enable them to swing freely to suit the movements of the bogie. The weight of the vehicle is finally borne by springs which are arranged immediately over the axle-boxes.

When applying the invention to freight-cars, where less flexibility is desired, the different parts may be modified in form to suit the different types of bogie employed. Thus, as shown in Figs. 5 to 7, where the freight-car body is borne by springs 42, bearing on sliding plates 43, the bell-crank levers are replaced by single-arm levers 33*; otherwise

the construction is similar to that above described with reference to passenger-cars, the similar parts being similarly numbered.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a railway-car or freight-vehicle the combination of four diagonally opposite links or the like, with lever-and-spring connections between the bogie-frame and car-body, substantially as hereinbefore described.

2. In a railway-car or freight-vehicle an elastic and flexible connection between the car-body and each bogie comprising in combination, chains or shackles linked to the car-frame and to bell-crank levers pivotally mounted on brackets fixed at or near each corner of the bogie-frame, coiled springs abutting against the said brackets and against collars or washers carried by rods secured to the bell-crank levers, and shoulders on the said rods adapted to abut against the brackets, substantially as hereinbefore described.

3. In a railway-car or freight-vehicle an elastic and flexible connection between the car-body and each bogie comprising in combination, chains or shackles linked to the car-frame and to single-armed levers pivoted on brackets fixed at or near each corner of the bogie-frame, coiled springs abutting against the said brackets and against collars or washers carried by rods secured to the levers, and shoulders on the said rods adapted to abut against the brackets, substantially as hereinbefore described.

In witness whereof we have hereunto set our hands in presence of two witnesses.

G. H. SHEFFIELD.
J. D. TWINBERROW.

Witnesses:
GEO. M. SHEPPARD,
JOS. B. MIDDLETON.