No. 855,649. PATENTED JUNE 4, 1907.

J. MELLAND-SMITH.

COUPLING FOR RAILWAY AND OTHER VEHICLES.

APPLICATION FILED JULY 12, 1906.

4 SHEETS—SHEET 1.

Fig. 1.

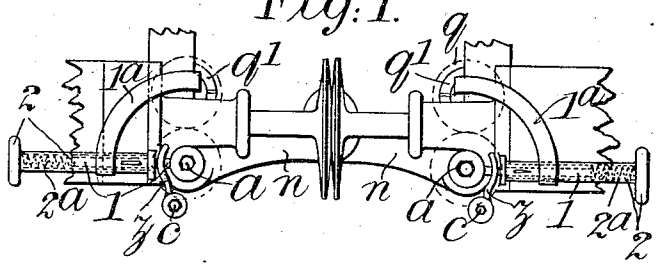


Fig. 4.

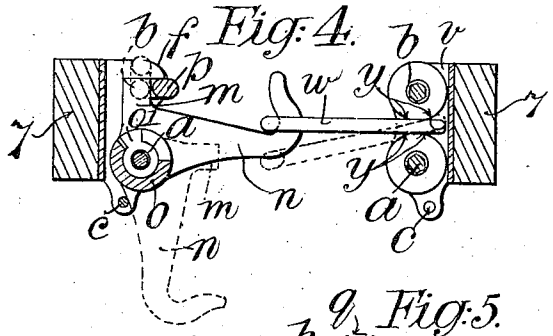


Fig. 5.

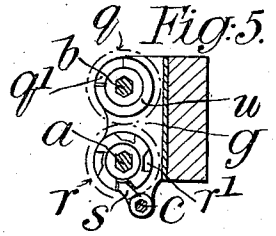
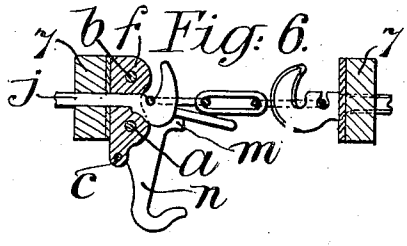


Fig. 6.



Witnesses:
L. E. Barkley.
W. E. Lawson

Inventor
Joseph Melland-Smith
by Francis Appleman
atty

THE NORRIS PETERS CO., WASHINGTON, D. C.

No. 855,649. PATENTED JUNE 4, 1907.

J. MELLAND-SMITH.

COUPLING FOR RAILWAY AND OTHER VEHICLES.

APPLICATION FILED JULY 12, 1906.

4 SHEETS—SHEET 2.

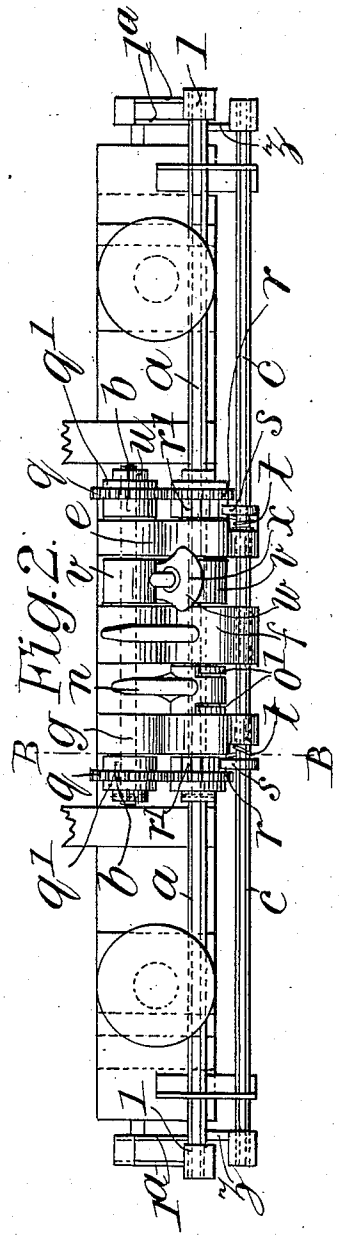


Fig. 2.

Witnesses:
L. E. Barkley.
W. E. Ladow.

Inventor
Joseph Melland-Smith
by Francis Appleman
Atty

THE NORRIS PETERS CO., WASHINGTON, D. C.

No. 855,649. PATENTED JUNE 4, 1907.

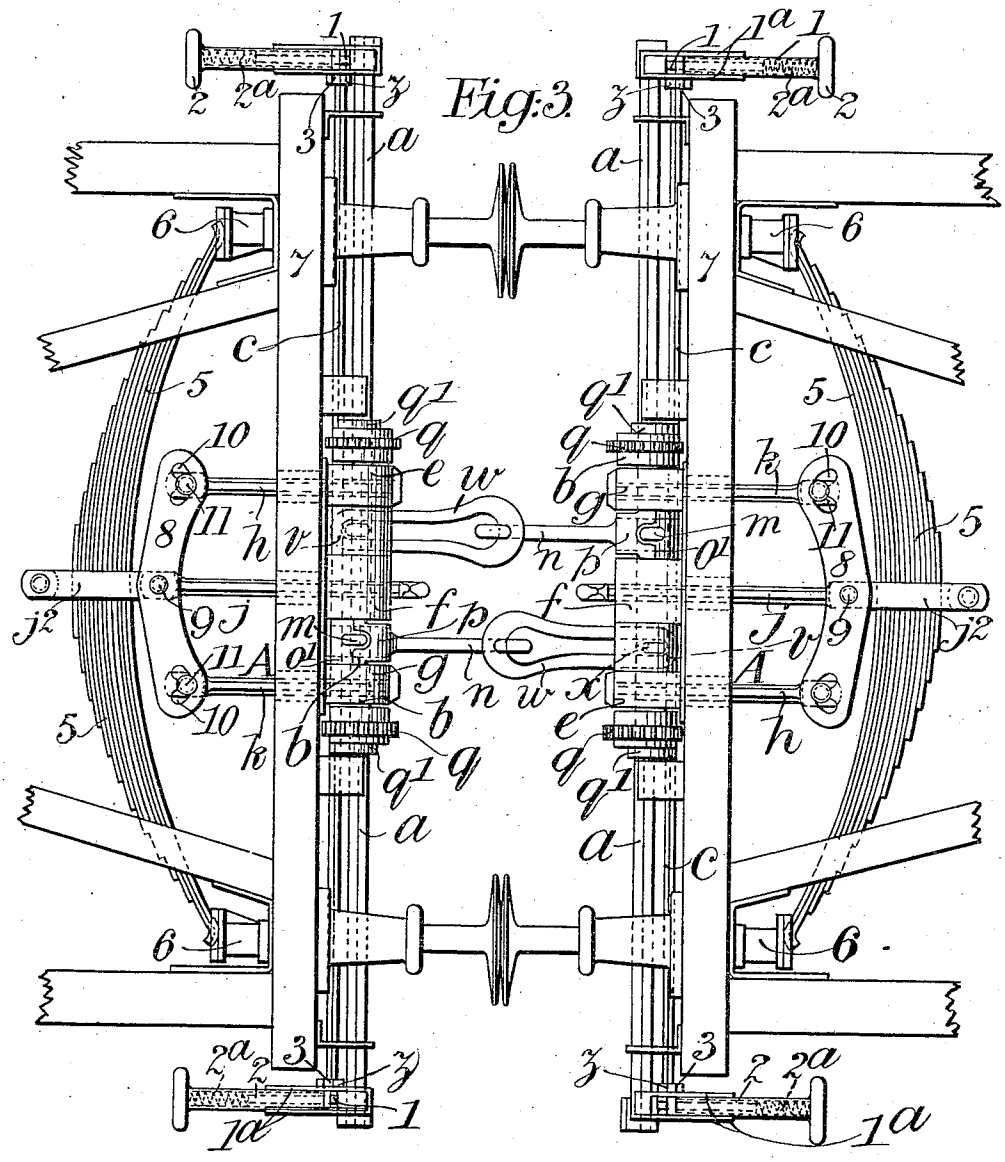
J. MELLAND-SMITH.

COUPLING FOR RAILWAY AND OTHER VEHICLES.

APPLICATION FILED JULY 12, 1906.

4 SHEETS—SHEET 3.

Fig. 3.



Witnesses:
L. E. Barkley.
W. C. Lawson.

Inventor
Joseph Melland-Smith
by Francis Ashcraft
Atty.

THE NORRIS PETERS CO., WASHINGTON, D. C.

No. 855,649. PATENTED JUNE 4, 1907.

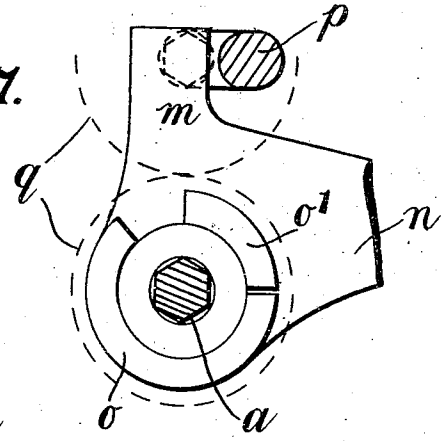
J. MELLAND-SMITH.

COUPLING FOR RAILWAY AND OTHER VEHICLES.

APPLICATION FILED JULY 12, 1906.

4 SHEETS—SHEET 4.

Fig. 7.



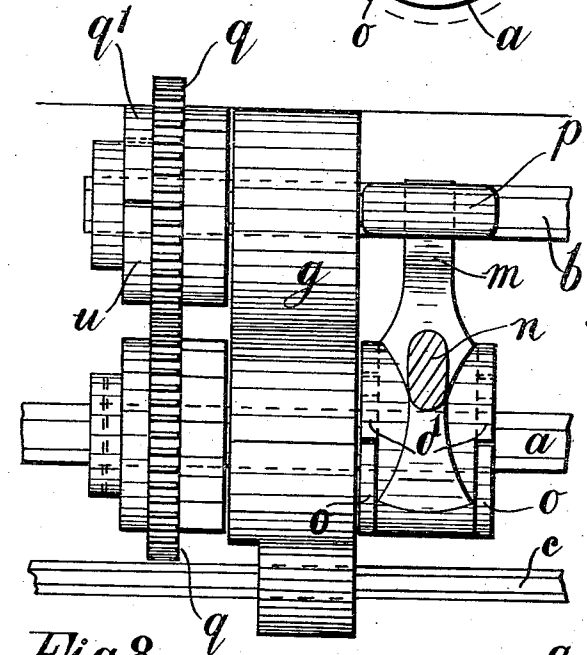


Fig. 8.

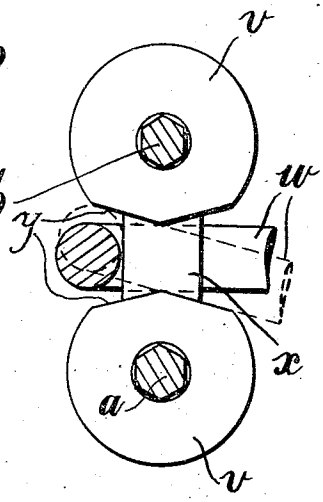


Fig. 9.

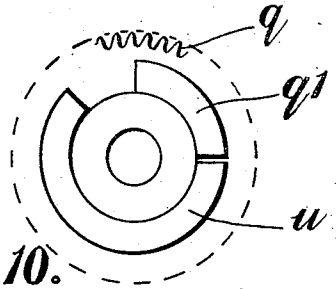


Fig. 10.

Witnesses:
L. E. Barkley.
W. E. Lawson

Inventor
Joseph Melland-Smith
by Francis. Appleman
atty

THE NORRIS PETERS CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JOSEPH MELLAND-SMITH, OF LONDON, ENGLAND.

COUPLING FOR RAILWAY AND OTHER VEHICLES.

No. 855,649. Specification of Letters Patent. Patented June 4, 1907.

Application filed July 12, 1906. Serial No. 325,903.

To all whom it may concern:

Be it known that I, JOSEPH MELLAND-SMITH, a citizen of the United Kingdom of Great Britain and Ireland, and a resident of 34 Old Broad street, London, England, engineer, have invented certain new and useful Improvements in Couplings for Railway and other Vehicles, of which the following is a specification, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in railway coupling devices by which the adjacent ends of two railway carriages may be doubly coupled, or uncoupled by means of mechanism adapted to be actuated from one or both sides of the carriage in a simple and effective manner thereby obviating the necessity of men going between the ends of the adjacent carriages for this purpose.

It is an object of this invention to provide an improved coupling device so arranged as to work in combination with existing couplings.

It is a further object of this invention to provide a novel device of this character which will relieve the existing draw bar arrangement of a great portion of strain it now has to bear.

It is furthermore an object of the invention to provide a novel device of this character wherein the possibility of a coupling link jumping from its hook when the carriages are brought into contact is obviated.

The invention has still further for its object to provide a device of this character which will be simple and efficient in operation.

With the above and other objects in view, the invention consists in the details of construction and the novel arrangement and combination of parts to be hereinafter more fully set forth and described.

In describing the invention in detail reference will be had to the accompanying drawings forming part of this specification wherein like reference characters denote corresponding parts in the several views and in which—

Figure 1, is a view in side elevation showing the coupling in operative position. Fig. 2, is an end elevation of the coupling. Fig. 3, is a top plan view of Fig. 1. Fig. 4, is a sectional view taken on the line A—A Fig. 3. Fig. 5, is a sectional view taken on the line B—B Fig. 2, Fig. 6, is a transverse sectional view showing a vehicle fitted with the coupling, coupled to an adjacent vehicle with a coupling chain of ordinary type. Figs. 7, 8, 9, and 10, are detail views enlarged of certain features of the invention.

In the drawings *a*, denotes a coupling bar, *b*, the crank bar and *c*, the lock bar mounted in the bearing *e*, *f*, and *g*, secured to the outer ends of the draw bars *h*, *j*, and *k*,. The coupling bar *a*, and lock bar *c*, extend transversely of the vehicle and entirely thereacross, while the crank bar *b*, extends but slightly to either side of the bearings *e*, *g*.

Mounted on the coupling bar *a*, is an arm *m*, to which the coupling hook *n*, is rigidly fixed, or as shown, formed in one piece therewith. The coupling bar *a*, can rotate within the arm *m*, to an extent that is determined by the clutch collars *o*, fixed to the shaft *a*, and adapted to engage the stops *o'*, on the arm *m*. The arm *m*, or coupling hook *n*, is held in its operative position by a crank *p*, on the bar *b*, which engages the free end of the arm *m*, said arm *m*, being at approximate right angles to the arm *n*.

Each end of the crank shaft *b*, is provided with a pinion *q*, that meshes with a corresponding pinion *r*, fixed on the coupling shaft *a*. The bosses *r'*, of the two pinions *r* are formed with ratchet teeth which engage pawls *s*, carried by the lock shaft *c*. Springs *t*, engage the pawls and hold the same in engagement with the ratchet teeth of the pinion bosses.

The pinions *q*, of the crank shaft are loosely mounted thereon and are connected thereto by clutch collars *u*, fixed to the shaft and corresponding projections *q'*, formed on the pinions so that for a portion of its rotation the pinions move idly without rotating the shaft. This is a well known construction and a detail thereof is believed unnecessary as the essential feature is to provide a construction to permit an idle rotation of the pinions with relation to the shaft *b*.

Mounted on the shafts *a*, and *b*, between the bearings *e*, and *f*, is a bracket *v*. On the intermediate part *x*, of the bracket *v*, is loosely mounted the coupling link *w*. This coupling link *w*, is capable of vertical movement to an extent limited by the facets *y*, formed on the bracket *v*. On the outer ends of the lock bar *c*, are the operating levers *z*. The outer ends of the coupling bar *a*, are provided with operating arms 1, working through guides 1[a]. Each arm 1, is provided

with a handle 2, that slides against the action of a spring 2^a. The handle is provided with a pin or projection 3, which bears against the adjacent lever z, of the lock bar when in its lower position and by which the lock bar c, may be so moved as to bring the pawls s, out of engagement with the ratchet teeth of the bosses r.

The bars a, b, and c, are preferably of hexagon cross section, as shown, so that the clutch bars of the coupling are prevented from rotating thereon without the use of keys, pins or other device calculated to weaken the bars and whereby parts may be easily removed and replaced or others substituted without trouble. At its inner end the central draw bar j, is pivoted at 9, to a link or buckle j^2, through which extends the spring 5. The ends of this spring 5, bear on the buffer blocks 6, carried by the vehicle headstock 7. Pivoted midway its length to the draw bar j, by the pin 9, is the cross head 8, and the end portions of this cross bar are provided with curved slots 10, in which work rollers or pins 11, carried by the inner ends of the draw bars h, and k,. Assuming two carriages in position for coupling and a coupling hook n, to be in operative position, the operation of the coupling is effected by turning downwardly either of the handle levers 1, so as to rotate the coupling bar a, until the hook n, is brought into its horizontal position and into engagement with the corresponding coupling link w, of the adjacent carriage. During the greater portion of this movement the pinions q, of the crank shaft b, are rotated idly by pinion r, of the coupling shaft a, and at the closing period of the operation when the arm m, of the coupling hook is near its vertical position, the crank shaft b, is partially rotated by the projection q', and the clutch collars u, coming in contact, so that the crank p, is caused to engage the arm n, and hold the hook in its operative position. The pawls s, by engaging the ratchet bosses r', of the pinions r, also hold the parts in their operative position.

Similar operation of either operating lever of the coupling bar a, of the adjacent carriage will, in like manner, cause the coupling hook n, of such bar to engage the coupling link w, of the first mentioned carriage so that the two carriages will be doubly coupled.

In order to uncouple the carriages, the spring key or handle 2, of either operating lever is first caused to slide on its lever 1, so that its inner end depresses the corresponding adjacent lever z, of the lock bar c, and thereby locates that bar against the action of the springs t, sufficiently to cause disengagement of the pawls s. The coupling shaft a, is then partially rotated in order to disengage and lower the coupling hook n, into its inoperative position. During this partial rotation the clutch collars o, do not come into action to move the coupling hook until the crank bar b, is rotated through the pinion q, and r, to rotate the arm m. Similar movement of the corresponding parts of the coupling apparatus of the adjacent carriage will in like manner disengage the other hook n.

In some cases the central draw bar j, may be omitted in which case the slotted portion j^2, that embraces the spring will be formed integral with or pivoted to the cross head 8. The improved coupling does not in any way prevent the use of a carriage fitted therewith in combination with a carriage fitted with existing coupling chains of ordinary type, as is thought to be plainly shown in Fig.6, in which case the central draw bar j, is used.

What I claim is:

1. Coupling apparatus for railway and other vehicles, comprising a coupling bar mounted to rotate in bearings carried by the draw head of the vehicle, a coupling hook for engaging a corresponding device on an adjacent vehicle, mounted to rotate to a limited extent on such bar, and a device adapted to hold said coupling hook in its coupling position, such device being adapted to be operated by the coupling bar that upon rotating the coupling bar the hook is moved into its operative position and the holding device is brought into operation, to place the hook in its inoperative position rotation of the coupling bar first actuates the catch to release the hook and then moves the hook in the desired manner, substantially as hereinbefore described.

2. A coupling apparatus comprising a coupling bar rotatably mounted, pinions on the bar, a cranked bar rotatably mounted, pinions on the cranked bar engaging the pinions on the coupling bar, and a clutch mechanism on the cranked bar acting in conjunction with the pinions on said cranked bar, said clutch mechanism permitting the pinions on the cranked bar to turn loosely thereon to a limited extent.

3. In a coupling apparatus, in combination a coupling bar rotatably mounted, a coupling hook thereon, and means whereby the coupling bar is locked against rotation in a direction to move the hook out of its operative position.

4. In a coupling apparatus, a coupling bar rotatably mounted therein, a cranked bar rotatably mounted, a coupling hook carried by the coupling bar, and means carried by the coupling bar for preventing the rotation of either the coupling bar or cranked bar.

5. Coupling apparatus for railway and other vehicles comprising three transversely arranged bars, mounted to rotate in bearings carried by the draw head of the vehicle, a coupling hook for engaging the corresponding device on an adjacent vehicle, mounted on one of such bars, and adapted to be engaged

when in its coupling position by a suitably formed portion of another of such bars, which is connected by gearing with the coupling hook bar, locking means on the third of such bars adapted to engage a part connected to either of the other two bars, and thereby prevent their rotation, operating means for the coupling hook bar and means connected to said coupling bar operating means whereby the third bar is so actuated as to release the locking means, substantially as hereinbefore described.

6. Coupling apparatus comprising a coupling bar, an arm on said coupling bar capable of a limited rotary movement thereon, a coupling hook engaging the arm, a cranked bar, and meshing gears on the coupling bar and cranked bar, said coupling bar and cranked bar being both capable of rotation.

7. Coupling apparatus, comprising three transverse bars mounted to rotate in three bearings fixed to the vehicle draw bars, the coupling hook being mounted on the coupling bar between the middle bearing and an outer one thereof, and the other outer bearing a bracket mounted on two of the transverse bars between the middle and outer bearing, a coupling link that projects away from the vehicle and which is so arranged that it can rise or fall and can move laterally to a desirable limited extent carried by the bracket, substantially as hereinbefore described.

8. In a coupling apparatus, a coupling bar, a lever carried thereby, and a coupling hook on the bar, a spring key carried by the lever, a second bar, a locking means thereon, and a lever carried thereby engaged by the spring key of the coupling bar.

In witness whereof I have hereunto set my hand in presence of two witnesses.

JOSEPH MELLAND-SMITH.

Witnesses:

SAMUEL S. BROMHEAD,

HENRY FAIRBROTHER.