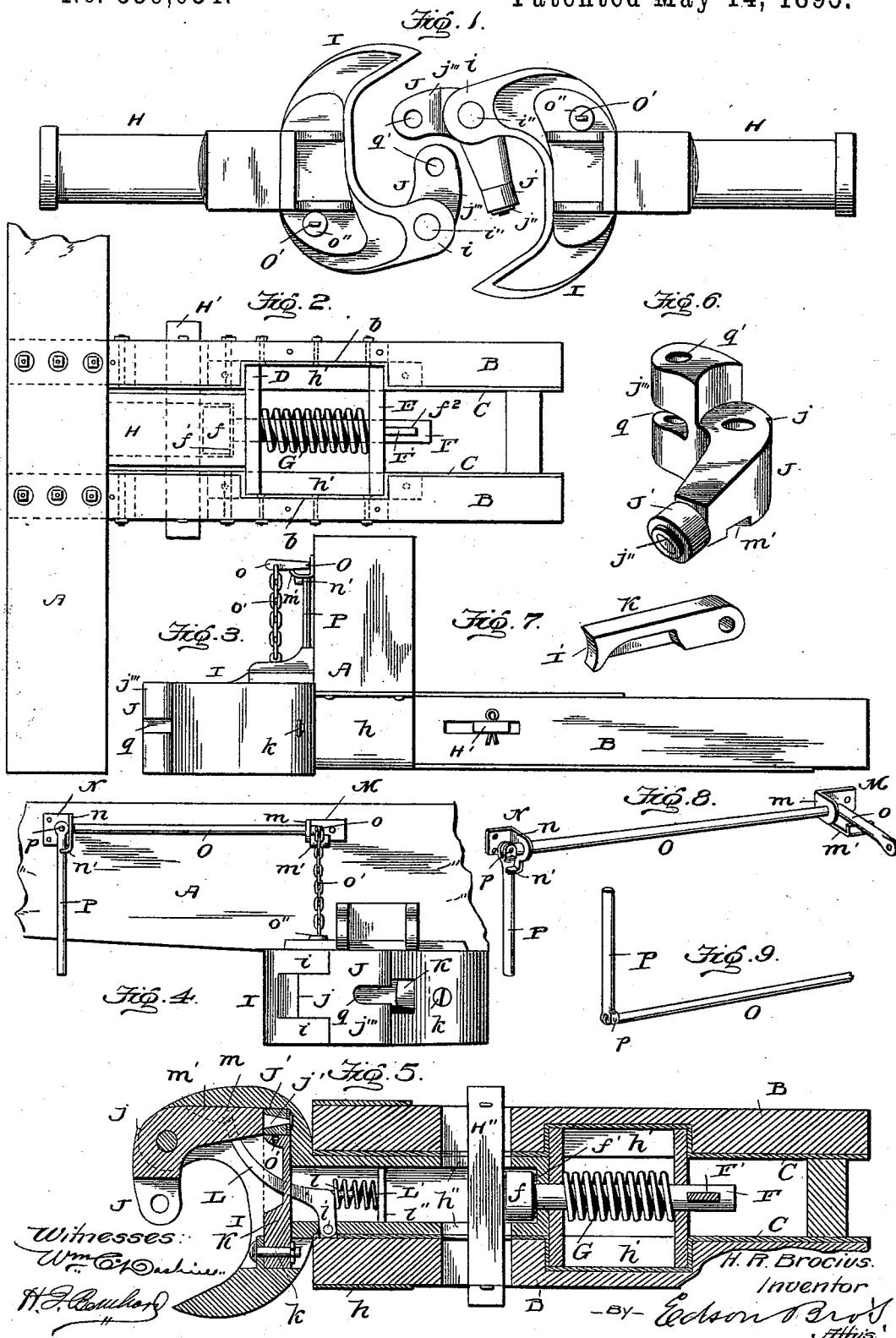


(No Model.)

H. R. BROCIUS.
CAR COUPLING.

No. 539,034.

Patented May 14, 1895.



UNITED STATES PATENT OFFICE.

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CAR-COUPLING.

SPECIFICATION forming part of Letters Patent No. 539,034, dated May 14, 1895.

Application filed December 28, 1894. Serial No. 533,182. (No model.)

To all whom it may concern:

Be it known that I, HARVEY RAYMOND BROCIUS, a citizen of the United States, residing at Summerville, in the county of Jefferson and State of Pennsylvania, have invented certain new and useful Improvements in Car-Couplers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to automatic car couplers of that class which employ a pivoted knuckle combined with means for locking the knuckle in place when engaged by a corresponding knuckle on another drawhead.

The leading purpose of this improvement is to provide an improved coupler which can be operated manually while the train is in motion and with the full draft or strain of the locomotive and train of cars, thereon, to cut out certain cars of the train without stopping the train or slackening the speed thereof, and at the same time the parts operate to hold the coupler securely locked against accidental uncoupling.

Among other things, the objects of the invention are to provide means for uncoupling the cars, designed to be operated by the brakeman while standing on the ground alongside of the track, or while on the car without leaning over the end of the same, to grasp the operating devices or of going between the cars; to provide improved means which act to automatically set the knuckle when it is released from the locking device so that the brakeman is not required to pass between the cars to set the knuckle, by hand, in position for coupling; to provide improved means for cushioning the endwise movement of the drawhead so as to reduce the shock and jar when the cars are coupled or when in motion; and to simplify the construction generally so as to increase the efficiency, and promote the strength and durability of the coupling.

It is the practice in shifting freight and other cars to make a "cut" or detach certain cars of the train while it is in motion, and with the ordinary couplings in use this operation of detaching moving cars requires that the speed of the engine and train shall be slackened to permit of manual operation of

the couplings in order to detach one or more cars.

Another difficulty encountered is that the exhaust steam and smoke blown down the track sometimes prevents the engineer from observing the brakeman's signals to the effect that the cars have been cut off from the train. This operation of stopping, or reducing the speed of, the train entails considerable strain and wear on the engine and cars because of the application of the brakes to retard the train previous to uncoupling.

With the cars equipped with my improved coupling, the operation of releasing the knuckle can be effected while the train is in motion, or while the full strain and draft of the engine and cars are on the coupling, so that it is not necessary to apply the brakes to retard the train previous to detaching certain of the cars, nor is it absolutely necessary for the engineer to be notified that the cars have been cut out of the train, because the engineer can give the signal to make the "cut" and after allowing sufficient time for the brakeman to accomplish the uncoupling of the cars, the engineer can proceed on his way.

To the accomplishment of the objects hereinbefore recited, my invention consists in the novel combination of devices and in the peculiar construction and arrangement of parts which will be hereinafter fully described and defined by the claims.

I have illustrated the preferred embodiment of my invention in the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a general plan view illustrating the position of the draw-heads ready to be coupled together. Fig. 2 is a plan view, on an enlarged scale, showing the cushions for the drawhead and its bar. Fig. 3 is a side elevation of the draw-head. Fig. 4 is a front elevation showing the operating-lever. Fig. 5 is a horizontal sectional view through the draw-head, the draw-bar, and the cushions. Fig. 6 is a detail view, in perspective, of the knuckle. Fig. 7 is a like detail view of the latch. Figs. 8 and 9 are detail views of the operating-lever.

Like letters of reference denote corresponding parts in all the figures of the drawings, referring to which—

A denotes the end sill of an ordinary car,

and B are the central sills of the car. These sills B are recessed on their opposing faces at intermediate points of their length, as at *b*, and the opposing faces or sides of these sills are faced by metallic plates C which extend into the recesses *b* which serve to strengthen the sills and to take up the wear. In these recesses are fitted the ends of the shock-plate D and the follower E, which parts are arranged parallel to each other and span the space between the recessed parts of the sills B, and these plates are formed with holes which are in line with one another to adapt the bolt F to be passed through said plates, as shown. The front end of this bolt, F, is formed with a head *f*, which bears against the closed rear end or head of the draw bar, and between this headed bolt and the draw bar is interposed a washer *f'* to take up the wear to which these parts are subjected. In the rear extremity of the draw bolt, F, is formed a vertical slot *f*², in which is fitted a vertical key F' that is adapted to take or bear against the plate E. Between the two plates D, E, is interposed a powerful coiled metallic spring G, which is fitted on the draw bolt F and which serves to normally force the two plates away from each other to the full limit permitted by the end walls of the recesses *b*, *b*.

H designates the draw bar which is fitted between the sills B and the wear plates to slide between the same, and which is held from dropping by the stirrup *h*, plates *h'* being bolted on the lower sides of the sills B between the recesses *b* to prevent the plates D, E, from displacement. This draw bar H is of the usual hollow form, and it has the draw head I produced on its front end in the usual way, this drawhead being of the curved form usually provided in couplers which employ a swinging knuckle. The drawbar, as has been stated is hollow and formed with a solid rear head through an opening in which the bolt F can be passed to bring the bolt head *f* against the solid head of said drawbar, and in this drawbar is cut a transverse horizontal slot *h''* through which is passed a horizontal key H' that is secured in the sills B and is provided with retainers to prevent endwise displacement of said key, whereby the key H' serves to hold the draw head and drawbar from being pulled off the car should the coiled spring G and the key F' be broken.

The drawhead, I, is formed with the usual chamber to receive the knuckle J when coupled with another knuckle, and between ears *i* produced on one side of the drawhead is fitted the elbow of the knuckle, a vertical bolt *i'* being passed through the ears and through the knuckle to pivotally support the latter in the drawhead. The movement of the knuckle, when it is swung outward, is limited by a stop flange, *j*, produced on the outer face knuckle, coming in contact with the edge of the draw head between the ears *i*, and the movement of the knuckle in the opposite direction being arrested by the inner member of the knuckle

coming in contact with the outer wall or side of the drawhead chamber. This knuckle is peculiarly constructed to adapt it to co-operate with a locking latch K in a manner to enable the knuckle to be released manually while the train is in motion or under the full pulling strain of the engine and preceding cars, for the purpose of detaching one or more cars without stopping the train, and yet, when the manual releasing devices hold the knuckle in place that it cannot be turned on its pivot to permit the cars to become uncoupled accidentally. The inner member, *j*, of the knuckle is reduced in the form of a conical pivot *j'* on which is loosely fitted a cone-bored cylindrical friction roller J', the latter being free to turn easily on the pivot *j'* and held in place by means of the washer and key *j''*.

The latch K is arranged in a horizontal position transversely across the drawhead chamber so as to occupy a position at right angles to the roller J' when the latch is engaged with the knuckle to lock the latter in place after the cars have been coupled; and this latch K is hung to the drawhead on the opposite side thereof from the side to which the knuckle is pivoted. This latch is pivoted to the drawhead by means of a horizontal bolt, *k*, which is secured in the drawhead well down toward the lower side thereof so that the pressure or strain of the knuckle on the latch, when the train pulls on the knuckle, will prevent the latch from being lifted and thus uncouple the cars accidentally, and this latch is of such length that its free end will drop down alongside of the friction roller J', when the knuckle is forced back into the drawhead chamber, so that the latch, which thus lies at right angles to the member, *j*, of the knuckle, will form an obstruction in the path of the member, *j*, of the knuckle to prevent it from being turned on its pivot by the strain or pull exerted on the knuckle. The latch is designed to be lifted automatically by the knuckle when the latter is turned and forced back by an approaching drawhead, so that the two knuckles may be automatically engaged, and to the accomplishment of this end I arrange the latch in the path of the roller J' on the knuckle and provide the outer face of the latch with the cam surface I' which is formed so that the roller, on the inward turning of the knuckle, will ride or bear upon the cam I' and lift the latch until the roller J' and the member, *j*, move clear past the end of the latch, whereupon the latter drops or falls by gravity into the path of the knuckle to prevent the latter from having turning movement until the latch has been lifted clear of the roller.

The knuckle, when released from the latch, is automatically thrown out into operative position by the action of a spring pressed arm or lever L, so that the brakeman is not required to pass between the cars for the purpose of setting the knuckle by hand. This arm or lever, L, is arranged within the drawhead chamber, on the bottom side or wall

thereof, and near its rear end, it is formed with a laterally extending lug, *l*, which is hung or pivoted to the drawhead by means of a vertical bolt *l'* that is suitably fastened on the drawhead. Against the heel of this lever operates a pressure spring *L'* that is confined in the drawhead chamber so as to be housed in and protected by the drawhead or the drawbar and is thus not liable to be broken or displaced; and said spring *L'* bears against the fixed abutment *l''* in the drawbar, the heel of the lever *L* being prolonged somewhat so as to fit into the coiled spring and aid in holding it in place. The front end of this lever, *L*, is formed with a prong *m*, that fits up into a recess *m'* formed in the lower face or side of the knuckle, and this prong bears against one of the boundary walls of the recess *m'* in a manner to force the knuckle out into operative position for engagement by the approaching drawhead, whenever the knuckle is released from the latch.

I have provided means for operating the latch and to release the knuckle by a brakeman standing beside the track, off to one side of the car, or from the top of the platform, so that the brakeman is not required to pass between the cars or lean over the platform when it is desired to free the latch from the knuckle and allow the latter to be turned by the lever *L*, either to uncouple the cars or to set the knuckle into position to be engaged by an approaching drawhead to automatically couple the cars.

To the end sill *A* of the car is fastened two brackets, *M*, *N*, provided with bearings *m*, *n*, respectively, which are arranged in line with each other so as to receive a horizontal rock shaft *O*, the latter being thus journaled in the bearings of the brackets to be easily turned therein. The bracket *M*, which is bolted to the sill *A* over the drawhead, is formed with a horizontal lip *m'*, upon which is adapted to rest the angular arm *o* of the rock shaft so as to limit the movement of the rock shaft and arm in a downward direction. To this angular arm, *o*, on the inner end of the rock shaft is attached a chain or link *o'*, which has its other end fastened to an eye on the pin *O'*, the latter being passed through a vertical aperture in the drawhead and attached to the upper side of the gravity latch *K*, and said pin *O'* being formed, near its upper end, with a flange or head *o''* which serves to exclude the water and snow from entering the drawhead aperture and from interfering with the free operation of the latch-lifting devices.

The bracket, *N*, which is bolted to the sill, *A*, near the side of the car is formed with a lug, *n*, that extends beyond the bearing *n* for the rock shaft and which forms a seat for the operating lever or handle *P*. One end of this lever is forked to form lugs, which receive between themselves a reduced tenon on the end of the rock shaft, and this lever or handle is connected to the rock shaft by means of a pivot pin, *p*, whereby the lever can be swung

to a position above, below, or in line with the rock shaft to operate the latter either from the side or platform of the car for the purpose of lifting the latch and releasing the knuckle. By turning the handle so as to rock the shaft and lift the latch, and then moving the handle to rest upon the lug *n* of the bracket *N*, the latch is held out of the path of the knuckle so that the car cannot be coupled.

To adapt the knuckle to be used in connection with ordinary pin and link couplers, a slot *q* is cut in the outer member, *j'''* of the knuckle, and a pin receiving aperture *q'* is cut vertically through the member *j'''* to intersect with the slot, whereby the ordinary link can be fitted in the slot *q* and the pin in the aperture *q'* to adapt the coupler to be connected to the common type of drawhead.

My coupler can be used in connection with any style of knuckle couplers, of which the Janney, Miller, and Gould types are the most familiar examples, as well as with the pin and link couplers to which reference has just been made.

The operation may be described as follows: To set the knuckle, the brakeman lifts the handle, *P*, and turns the shaft *O* to lift the pivoted latch out of the path of the roller, *J'* on the knuckle, whereupon the spring-pressed lever *L* turns the knuckle on its pivot and moves it into operative position shown in Fig. 1. As the knuckle on an approaching drawhead strikes the inner member, *j*, or roller *J'* on the knuckle, it is forced around on its pivot so that the roller *J'* rides against the cam *I'* and lifts the latch *I*, and at the same time the outer member *j'''* of the knuckle interlocks with the other knuckle on the approaching car, the latch *K* operating by gravity to drop against the side of the roller *J'* and lie in the path of the inner member, *j*, of the knuckle, thus locking the latter securely in place. As the cars come together, the drawhead and bar are forced inward to compress the spring *G* which thus cushions the movement of the drawhead and relieves the cars to a great extent from the shock and jar due to the coupling thereof. To release the knuckle and permit the cars to be uncoupled, the lever *P* and shaft *O* are turned to raise the latch out of the path of the roller and knuckle; and this roller offers such minimum resistance to the lifting movement of the latch, that the knuckle can be released even when the cars are in motion and the engine and train are pulling on the knuckle. By reason of the latch being pivoted to drop down at right angles to the roller, and being arranged to close down toward the bottom side of the drawhead, it operates to effectively lock the knuckle against any strain that may be brought on the knuckle by the pulling of the engine, and the knuckle is thus locked by the latch until the latch is raised by manual operation of the rock shaft and lever.

I am aware that changes in the form and proportion of parts and in the details of con-

struction herein shown and described as an embodiment of my invention can be made by a skilled mechanic without departing from the spirit or sacrificing the advantages of my invention, and I therefore reserve the right to make such modifications and alterations as fairly fall within the scope of my invention.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a car coupler, substantially such as described the combination with a drawhead, of a swinging knuckle provided with a roller, and a latch mechanism arranged in the path of said roller on the knuckle and adapted, when the knuckle is turned inward, to prevent the same from turning on its pivot, as and for the purposes described.

2. In a car coupler, substantially such as described, the combination with a drawhead, of a knuckle pivoted thereto and having its inner member provided with a roller, and a latch-bar pivoted to the drawhead and arranged at right angles to the roller and knuckle when the parts are locked, as and for the purposes described.

3. In a car coupler, substantially such as described, a knuckle having its inner end provided with a tenon and a roller fitted loosely on said tenon, in combination with a drawhead, and a latch pivoted in the drawhead and arranged at right angles to the knuckle when the latch and knuckle are engaged, as set forth.

4. In a car coupler, the combination with a drawhead, of a swinging knuckle provided with a friction roller, and a latch pivoted to the drawhead to lie in the path of said roller and provided with a cam surface against which

said roller impinges, to lift the latch, when the knuckle is turned inward, as and for the purposes described.

5. The combination with a drawhead, a knuckle, and a latch, of a setting arm, L, having its heel, Z, pivoted to the drawhead and its free end fitted against the knuckle to slide thereon, and a spring bearing against the heel of the setting arm at one side of its pivot, as and for the purposes described.

6. In a car coupler, the combination with a drawhead, and a knuckle, of a setting arm housed within the drawhead, pivoted thereto, and having an arm bearing against the knuckle, and a spring which bears against the heel of the setting arm, substantially as and for the purposes described.

7. In a car coupler, the combination with a drawhead and a swinging knuckle, of a latch, fixed brackets forming journal bearings, a rockshaft journaled in said brackets and connected with the latch, and a reversible handle or lever pivoted to the rock shaft, substantially as and for the purposes described.

8. The combination with a latch, of the fixed brackets, one having the seat *n'*, a rock shaft journaled in the brackets and having its inner end connected to the latch, and a reversible handle pivoted to the outer end of the rock shaft and adapted to rest upon the seat *n'*, substantially as and for the purposes described.

In testimony whereof I affix my signature in presence of two witnesses.

HARVEY RAYMOND BROCIUS.

Witnesses:

GEORGE OSBORN,
HIRAM F. GUTHRIE.