(No Model.) 2 Sheets—Sheet 1.

A. F. GUHL.

CAR COUPLING.

No. 569,639. Patented Oct. 20, 1896.

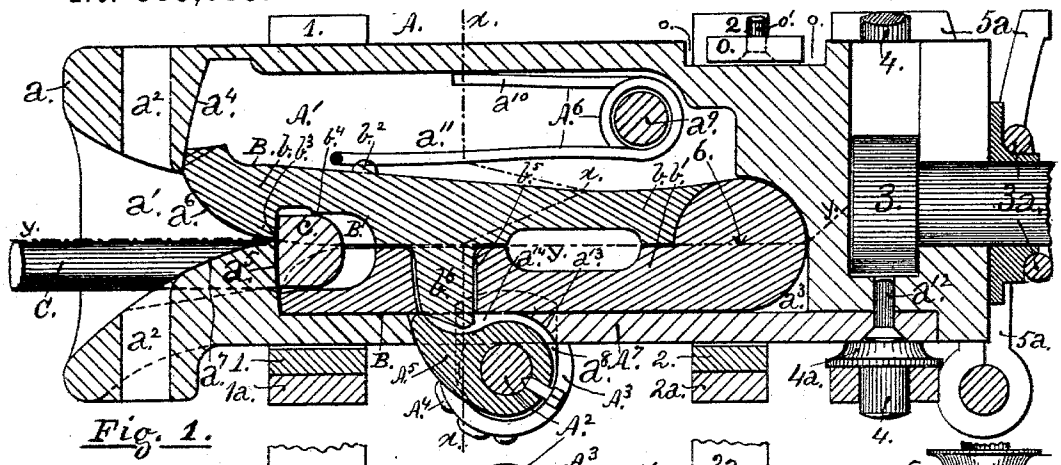

Fig. 1.

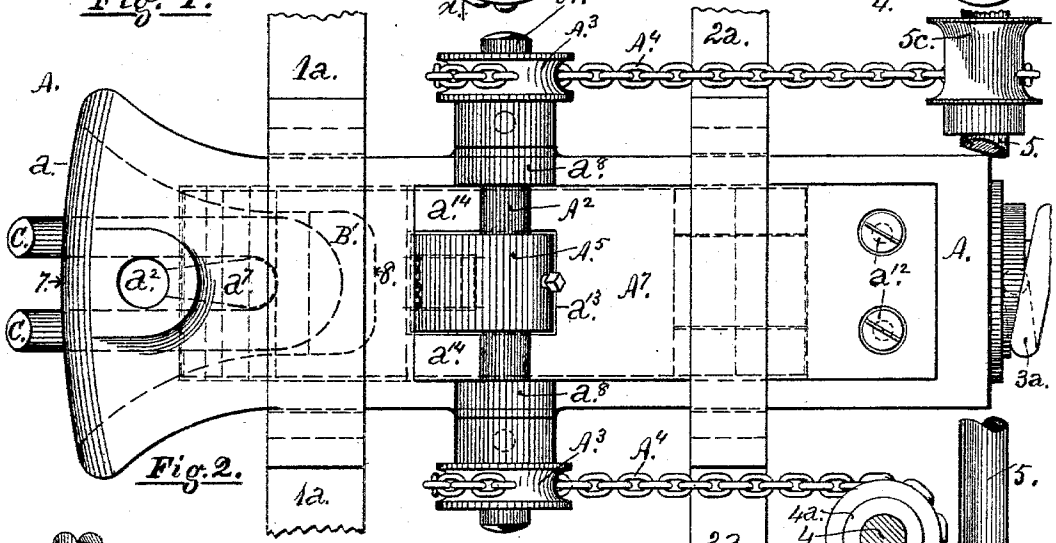

Fig. 2.

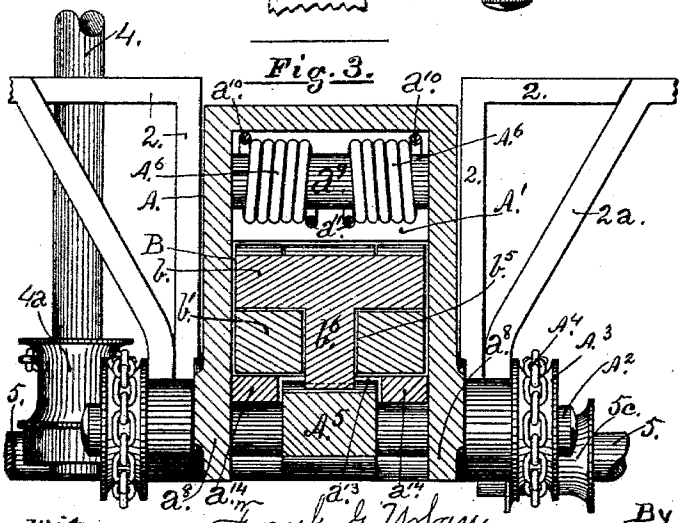

Fig. 3.

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Attorney.

(No Model.) 2 Sheets—Sheet 2.

A. F. GUHL.

CAR COUPLING.

No. 569,639. Patented Oct. 20, 1896.

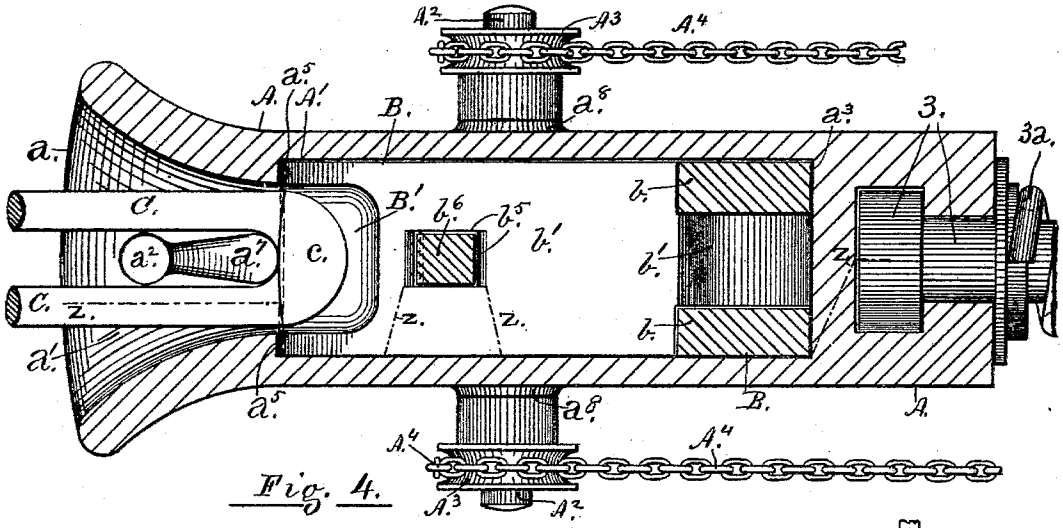

Fig. 4.

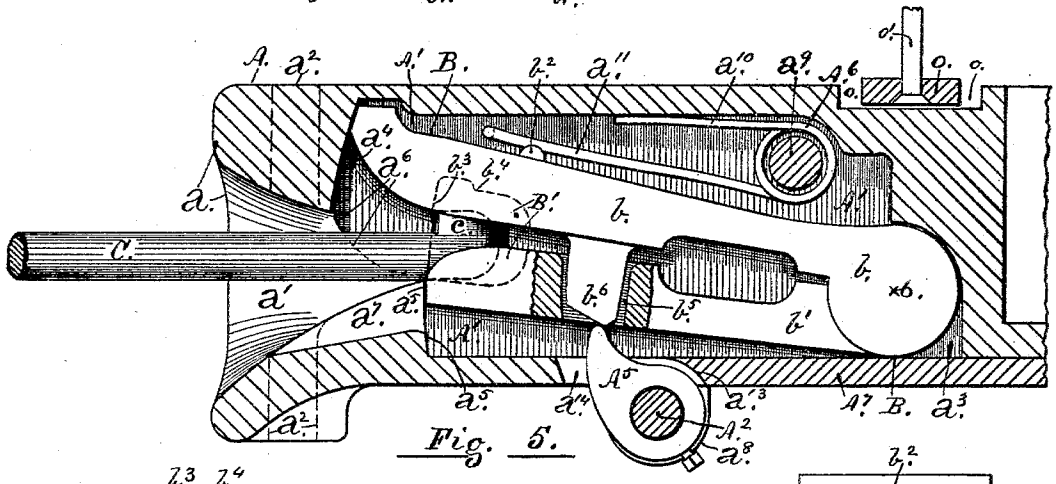

Fig. 5.

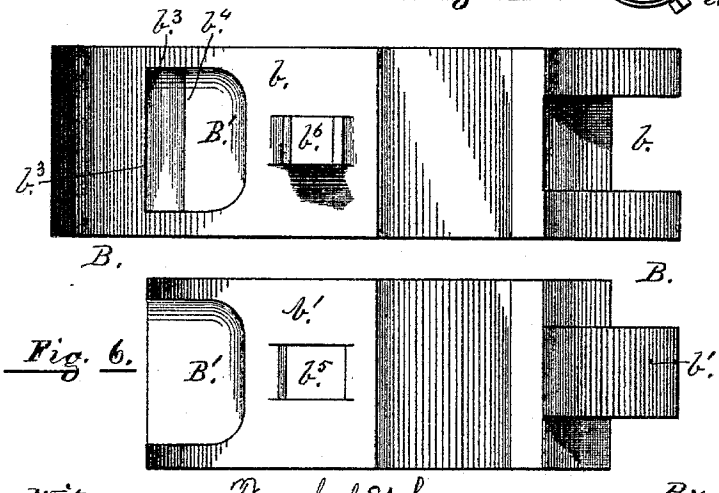

Fig. 6.

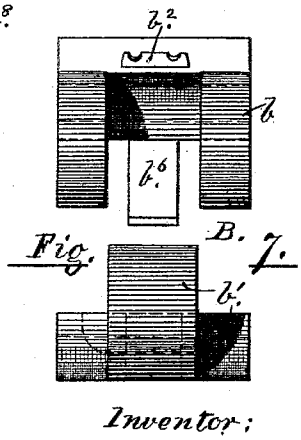

Fig. 7.

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UNITED STATES PATENT OFFICE.

ALBERT F. GUHL, OF ROWENNA, PENNSYLVANIA.

CAR-COUPLING.

SPECIFICATION forming part of Letters Patent No. 569,639, dated October 20, 1896.

Application filed April 22, 1895. Serial No. 546,651. (No model.)

To all whom it may concern:

Be it known that I, ALBERT F. GUHL, a citizen of the United States, residing at Rowenna, in the county of Lancaster and State of Pennsylvania, have invented certain new and useful Improvements in Automatic Car-Couplings; 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.

This invention relates to improvements in automatic car-couplings of that class in which, at a prescribed distance from the usual bull-nose, the forward end of the draw-head, through the bottom thereof, is provided with a specially-formed chamber in which is operatively housed a specially-formed block, with means provided to hold the forward end thereof normally down, allowing it to be raised, and with means provided to raise said end when required.

The object of the invention is to provide a device whereby the ends of cars may be automatically linked or coupled securely together to make up trains and whereby said cars may be again uncoupled or separated with absolute safety to the attendant or person in charge of the same.

The elements of the invention, together with the functions they perform, will separately and distinctly appear in the following description and will be severally and fully set forth in the claims.

The purposes of the invention are attained by the mechanism, devices, and means illustrated in the accompanying drawings, with similar letters of reference to designate like parts throughout the several views, in which—

Figure 1 is a longitudinal vertical central section of a detached draw-head embodying the elements of the invention, with portions of securing devices and uncoupling mechanism in place; Fig. 2, an inverted plan of the same; Fig. 3, a sectional view from the left of the portion lying practically to the right of the line *x x* in Fig. 1; Fig. 4, a horizontal sectional plan taken practically on the line *y y* in Fig. 1; Fig. 5, a view similar to Fig. 1, showing the coupling-block and lift-cam in the positions of uncoupling, with a portion of the block cut away on the line *z z* in Fig. 4; Fig. 6, detail plans showing the adjacent faces of the coupling-block; and Fig. 7, a rear end elevation of the same, showing them in detached positions.

In the drawings, A designates the draw-head, practically of the same pattern or form and preferably of the same material (cast-iron) as the draw-heads now in common use, and it may be attached in the usual way to the front and rear ends of cars for coupling said cars together; but in the rearward portion of the draw-head, transversely across the upper face thereof, is formed a recess *o*, Figs. 1 and 5, of prescribed width, in which an iron block O, Fig. 1, rigidly secured in place to the body of the car by bolts *o* or in any other approved manner, with sufficient clearance between its front and rear edges and the adjacent edges of said recess, and which block serves to hold the draw-head in pulling and to receive its impact in coupling, in both cases preserving the elasticity or resiliency of the buffer-spring.

1 and 1^a, 2 and 2^a designate, respectively, yokes and brace-bars, having their upper ends secured in any approved manner to the under sides of said car ends, (not shown in the drawings,) adapted to hold the front and rear ends of a draw-head suspended there in place.

3 designates a portion of a bolt which secures the rear end of a draw-head to the cross-beam of the car in the usual way, and 3^a designates a portion of the usual buffer-spring on said bolt to relieve said draw-head from the impact of the one bumping against its forward end when cars are being coupled.

4 designates a portion of a vertical shaft, which is rotatably mounted at the ends of a car, extending a prescribed distance above the end platform or to the top thereof, where its upper end may be provided with a crank-handle or a hand-wheel to rotate it, and its lower end is provided with a winding-drum 4^a; and 5 designates portions of a horizontal shaft extending across the body of the car and journaled through bearings in hangers 5^a, secured to the under side thereof, having on each end a crank-handle or hand-wheel 5^b for rotating it and on its body a winding-drum 5^c, either of which drums 4^a or 5^c may be used in uncoupling, as will be hereinafter described. These several elements may be

varied or changed at pleasure or according to the conditions of the car to which they are applied, but the particular features of the invention will now be described.

The coupling-block housing-chamber is practically an oblong rectangular recess A′, opening through the bottom and located in the forward end of the draw-head A, and at a prescribed distance from the bull-nose a thereof, having through its vertical face an inwardly sloping and narrowing orifice a', opening into said chamber for the passage of a coupling-link, yet to be described, and vertically through its body, between said bull-nose and chamber, an orifice a^2, to receive a pin for coupling cars together in the usual way with the well-known closed link. In the lower portion of the rear end wall of the chamber is a recess a^3, formed by a vertical face terminating in a forwardly-extending concaved cylindrical arch of about forty-five degrees, radiating from the point 6, through which extends the pivot-axis of the coupling-block yet to be described.

The forward end wall has in the upper and lower portions thereof similarly-concaved faces a^4 and a^5, radiating from the same point 6, the former having a greater radial extent than the latter from said point, and they are joined by a downwardly and rearwardly curving face a^6 about the link-orifice a', before mentioned, a^4 and a^5 constituting continual bearings against which the forward ends of the coupling-block portions will always abut, and a^6 supports the upper forward end thereof when the coupling is completed or when the block rests in the position ready for coupling.

Within the opening a', along the sides thereof, the lower sloping face is cut away or recessed, leaving an upwardly-sloping central ridge or nose a^7, forming, with the face a^5 before mentioned, a hook to engage the closed end of the link used in coupling. At the prescribed point in the under face of the draw-head, at the sides thereof, are downwardly-projecting lugs a^8, having journaled therethrough a shaft A^2, carrying on its extremities rigidly-secured grooved wheels A^3, to which are secured the outer ends of chains A^4, having their inner ends secured, one to the winding-drum 4^a and the other to the winding-drum 5^c, both before mentioned, whereby either drum will serve to rotate said shaft when uncoupling is desired, and to the body of the shaft, between said lugs a^8, is rigidly secured a lever-arm or lift-cam A^5 to lift the coupling-block portions performing the uncoupling. Toward the rearward end of the chamber, in the space above the coupling-block and having its extremities secured into the sides of the draw-head, is a pin or bolt a^9, supporting on its shaft the oppositely-wound coil of a double-armed spring A^6 of resilient wire, having one set of arms a^{10} pressing against the top wall of the cross-head, and the double-arm a^{11}, forwardly extending, to engage the top of said coupling-block well toward the forward end thereof, allowing said end to rise when coupling is desired, and holding it down when coupling is completed. Into the opening through the bottom a plate A^7 is fitted and secured in place by headed screws a^{12} passing through the rearward end thereof and tapped into the body of the draw-head, the forward end of the plate having a recess a^{13} for the cam A^5 to operate in, while strips a^{14}, on the sides of said recess, rest on the shaft A^2 to support the forward end of said plate, with the forward edges of said strips abutting against the body of the draw-head. This plate is thus adapted to practically close the bottom of the draw-head, properly housing or supporting the coupling-block within the chamber A′. (See Figs. 1, 2, and 3.)

A coupling-block B, comprising two portions, b the upper and b' the under, (shown in detail in Figs. 6 and 7,) rule-jointed at one end, but without a pivot-pin, practically making it a single body, adapted to be passed endwise through the bottom opening into the housing-chamber A′, the forward ends of its portions b and b' abutting against the concaved faces a^4 and a^5, the rear or jointed end thereof resting in the recess a^3, and the forwardly-projecting spring-arm a^{11} contacting with the top of the portion b and resting in guide-notches formed in a strip b^2, secured near to the forward end thereof.

In the forward end of the block, partially contained in each of the portions b and b', and through the adjacent faces thereof, is formed, practically, a socket-recess B′, having a prescribed depth, which the link end enters in coupling and against the bottom of which said end abuts to compel coupling in the opposing draw-head. This recess forms in the forward end of the upper portion b a hook edge b^3 to engage a hook projection, yet to be described, on the coupling-link end, assisting in coupling as well as preventing uncoupling under all conditions, without first lifting the portion b from the portion b', and along said hook edge is placed a subrecess, forming an edge ledge b^4 to press on top of the coupled end of the link, holding said link in position to enter the coupling-orifice in the opposing draw-head. Through the body of the portion b', at the requisite point, is formed an aperture or orifice b^5, for the passage of a lug or stud b^6, secured to the under face of the portion b, which stud projects a prescribed distance, in a rearwardly and downwardly inclined plane, below the bottom of said portion b', to be engaged by the lift-cam A^5, whereby said cam in raising the block B for uncoupling raises the portion b to a greater height than the portion b', thereby lifting its edge hook b^3 from the hook projection of the link before mentioned. (Best shown in Fig. 5.)

A link C, having a prescribed length, width, and depth, with sufficient space between its side shafts to freely admit the coupling nose or hook a^7, has on one side of its ends, say

the upper, upward projections or blocks c, forming offset notches or hooks to enter the socket B′ of the coupling-block and adapted to engage the edge hook b^3 in the portion b thereof, assisting in coupling as well as preventing uncoupling under all conditions of the coupling-block, or until its portions are raised to the positions indicated in Fig. 5.

The outside length of the link over all should always be a little greater than twice the distance from 7 in the bull-nose face to 8 in the base of the coupling-block socket, and the inside length thereof should be as much greater than twice the distance from said point 7 to the inner end of the nose or hook a^7, to compel and allow coupling in the opposing draw-head; but said greater length should always be a little less than twice the distance from said nose or hook end to said point 8 and always greater than once said latter distance to prevent said link from being crushed or bent in coupling.

It is old in car-coupling to use draw-heads provided in their forward ends with pivoted blocks having hooks or jaws to hold arrow-heads or links and to disconnect the same by raising or rotating said blocks when uncoupling is desired; but in all of these cases said blocks are pivoted in place by means of additional pins, and, with few exceptions, their forward ends project through to the bull-nose edges, while in this invention the block in question forms its own pivot, and the chamber in which it is housed constitutes its bearing.

Having thus described the invention and fully ascertained and shown the manner in which it is performed, what is considered new, and desired to be secured by Letters Patent, is—

1. In an automatic car-coupling with a draw-head adapted to be secured to the body of a car as shown; a coupling-block housing-chamber within the draw-head, near to the bull-nose end thereof, having the recess, a^3, in the rearward end wall, and the abutting curved portions, a^4 and a^5, in the forward end wall, the curved portions having each a different radial extent from the pivot-point, 6, with the link-mouth, a', opening through the bull-nose face into the chamber, having the curved portion, a^6, about, and the link-holding hook, a^7, within said opening, with a link-shaft recess on each side of the hook; of a two-parted block, rule-jointed at one end, fitted into said chamber, and a plate secured into the bottom of the draw-head; with means provided, such as the described link, C, to connect two draw-heads; and, with mechanism provided to manipulate said block, substantially as described and for the purpose hereinbefore set forth.

2. In an automatic car-coupling of the character described, a coupling-block comprising two portions, placed one above the other, rule-jointed at one end and adapted to be placed within the housing-chamber as shown, the jointed end within the rear end wall recess, and the forward ends of the portions in contact with the curved portions of the forward end wall; a notched spring-arm-supporting strip secured, forwardly, to the top of the upper portion; a coupling-link end recess in the adjacent faces of both of the portions, with a link-retaining hook constituting the front wall of said recess in the upper portion, and an edge ledge, rearward of said wall, in the top of said recesses; a vertical opening through the body of the lower portion of the block, and a lifting finger or lug, as shown, extending through said opening and secured to the under face of the upper portion of said block, all substantially as described and for the purpose hereinbefore set forth.

3. In a car-coupling of the character described, with a draw-head having the usual bull-nose end, the usual link-entering opening therein, with a link-retaining nose or coupling-hook and a link-shaft channel on either side of said hook, of the coupling-block housing-chamber opening through the bottom thereof and situated in the forward portion of the draw-head with a bottom plate provided to close said opening, said chamber having a rear end wall recess with a circular arched upper face, and lower and upper front end wall circular arc portions, said arched face and circular arc portions radiating from a common center and situated at different radial distances from said center, said center constituting the pivot-axis of the coupling-block, and the rearwardly and downwardly sloping concaved portion on either side of said link-entering opening joining said circular arc portions, all substantially as described and for the purpose hereinbefore set forth.

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

ALBERT F. GUHL.

Witnesses:
PAUL A. HERR,
DANL. H. HERR.