Sept. 2, 1924. 1,507,036

H. E. VAN DORN

CAR COUPLER

Filed Oct. 17, 1917 3 Sheets-Sheet 1

Fig. 1.

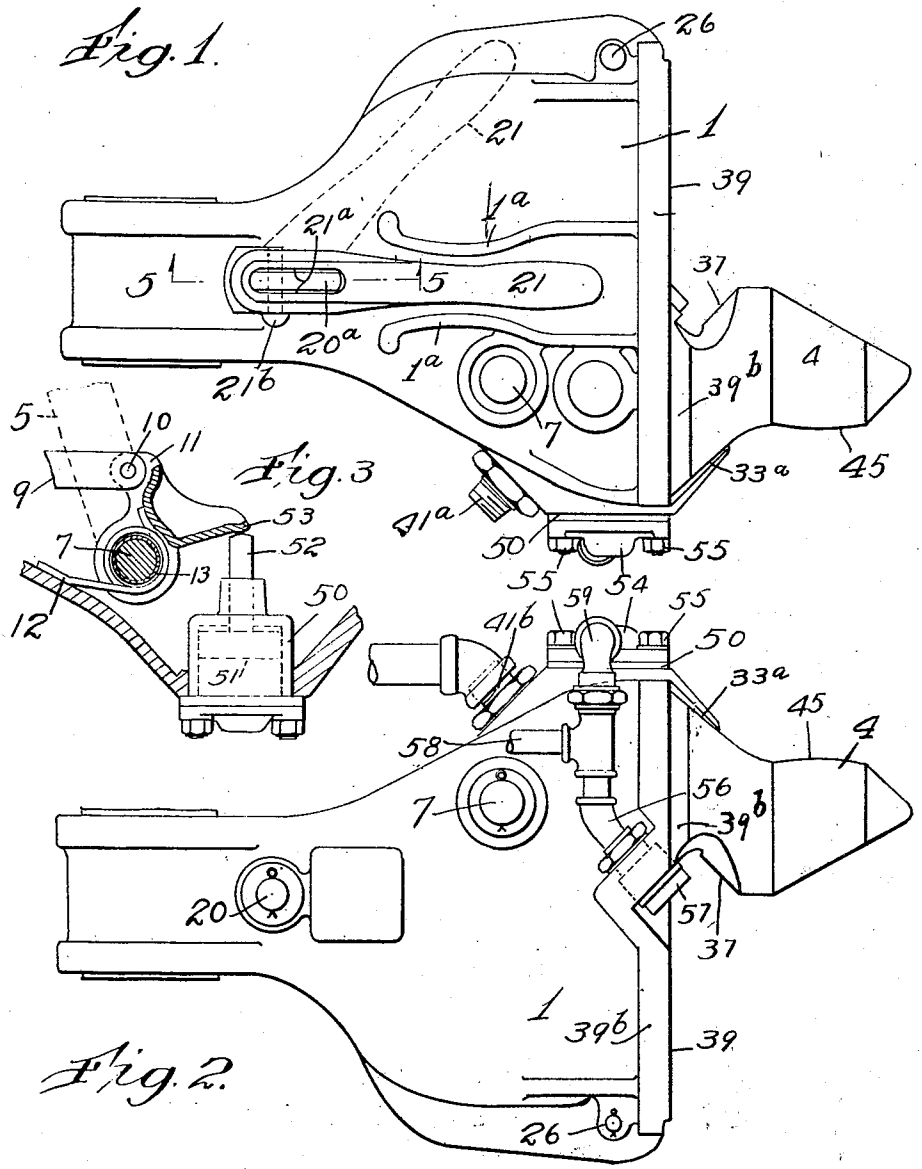


Fig. 3.

Fig. 2.

Witnesses:

Inventor:
Herbert E. Van Dorn,
by Parker & Carter
his Attys.

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Fig. 4.

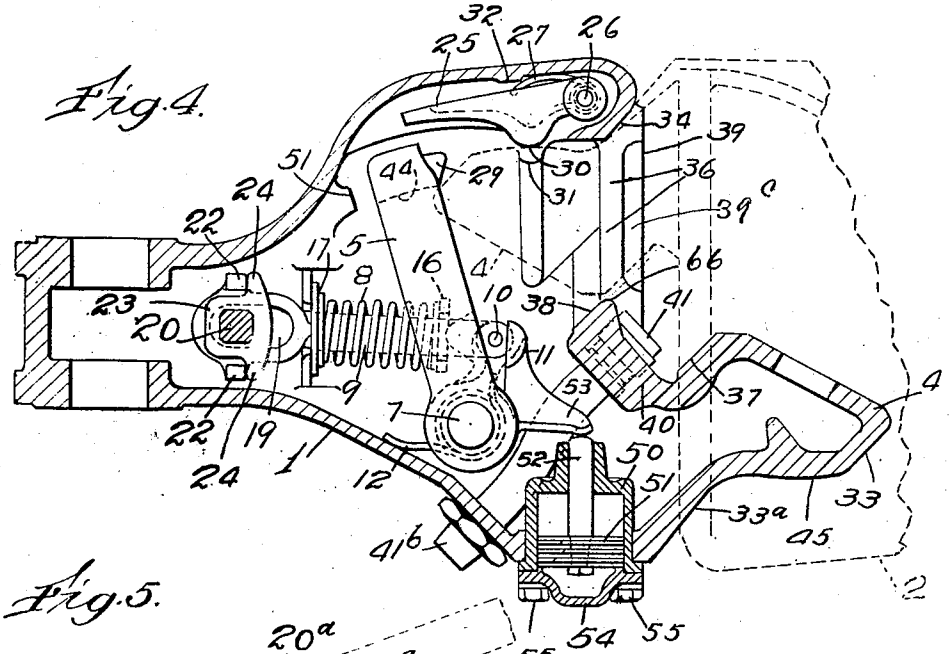
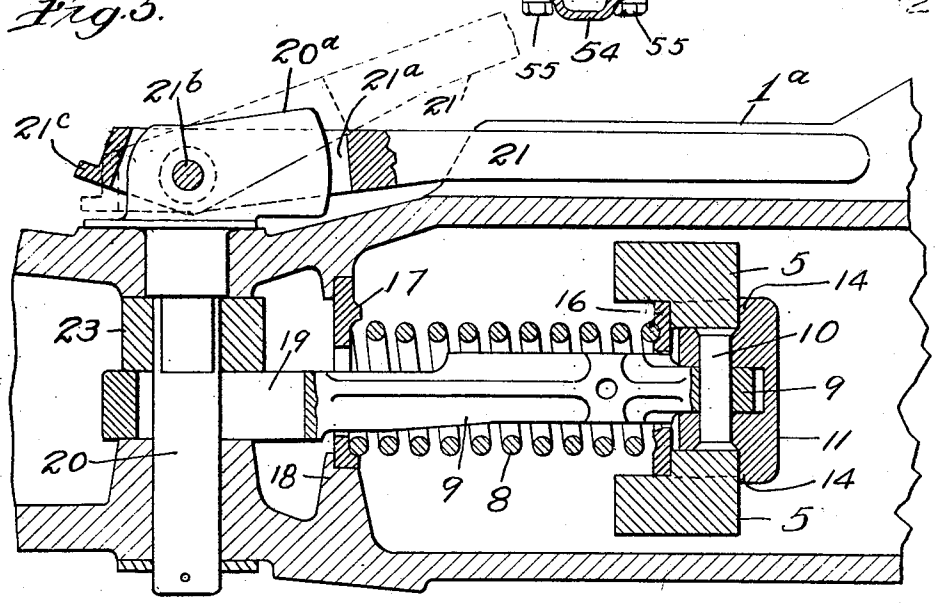
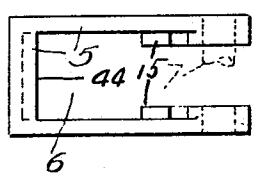


Fig. 5.



Witnesses:

Fig. 9.



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Fig. 6.

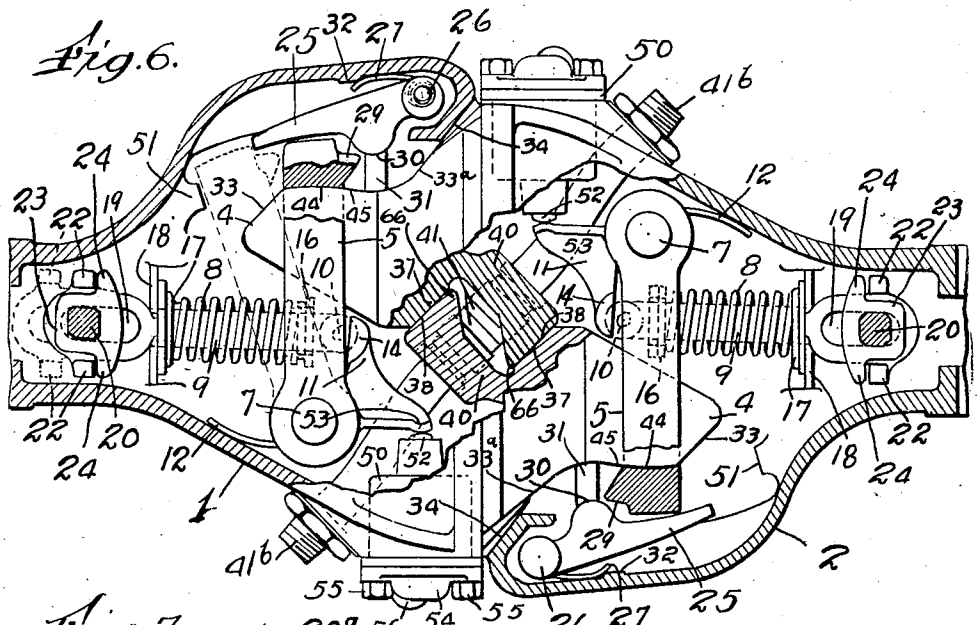
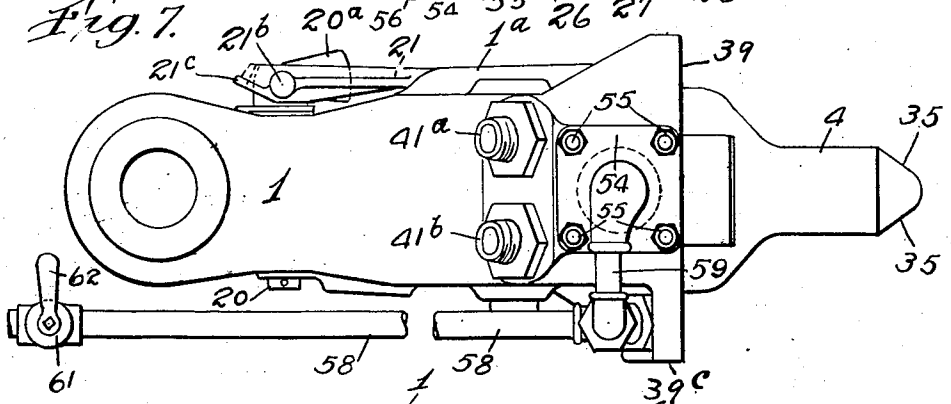


Fig. 7.



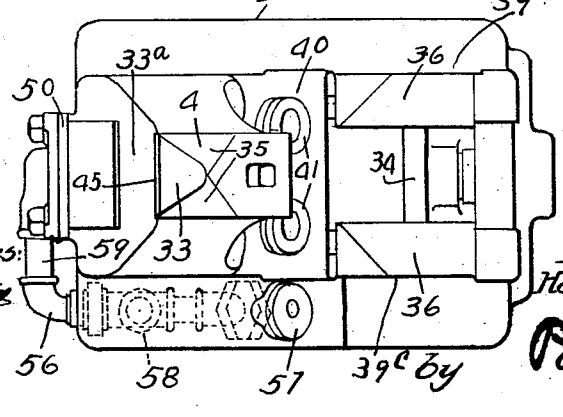


Fig. 8.

Witnesses:
C. A. Hunter

Inventor:
Herbert E. Van Dorn
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Patented Sept. 2, 1924. 1,507,036

UNITED STATES PATENT OFFICE.

HERBERT E. VAN DORN, OF CHICAGO, ILLINOIS.

CAR COUPLER.

Application filed October 17, 1917. Serial No. 197,060.

To all whom it may concern:

Be it known that I, HERBERT E. VAN DORN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Car Couplers, of which the following is a specification.

This invention relates to car couplers and has for its object to provide a new and improved device of this description. The invention is illustrated in the accompanying drawings, wherein—

Figure 1 is a plan view of one of the coupler heads of a car coupler embodying the invention;

Figure 2 is a bottom view of the device shown in Fig. 1;

Figure 3 is an enlarged detail view showing the air cylinder and associated parts;

Figure 4 is a horizontal sectional view of the coupler head shown in Fig. 1;

Figure 5 is an enlarged sectional view taken on line 5—5 of Fig. 1;

Figure 6 is a view in part section showing the two coupler heads coupled together;

Figure 7 is a side elevation of one of the coupler heads;

Figure 8 is a front elevation of one of the coupler heads;

Figure 9 is a view showing the locking part.

Like numerals refer to like parts throughout the several figures.

Referring now to the drawings, I have illustrated a car coupler having the coupler heads 1 and 2. These coupler heads are provided with the coupling parts 4, which are rigid with the coupling heads and preferably integral therewith. The coupling part on one coupler head is adapted to project into the interior of the opposed coupler head as indicated in Fig. 6. Within each coupler head is a locking part 5 provided with a receiving opening 6 for the coupling part on the opposite coupler head. In the particular construction shown the locking part 5 is an U-shaped piece of metal (see Fig. 9) and is pivotally connected to the coupler head by means of the pin 7, the pin passing through the locking part near its open end. This locking part forms, as it were, a yoke and the end is preferably left open to facilitate assembling the parts. Associated with each locking part is a spring 8 which surrounds a controlling part 9 pivoted at 10 with a pivoted piece 11, which is also pivoted on the pin 7. The pivoted piece 11 is preferably provided with a retracting spring 12 which has one end engaging the coupler head, the other end engaging the pivoted piece (see Figs. 3 and 4). This spring surrounds the pin 7 and I prefer to provide a tube 13 which surrounds the pin, the spring surrounding the tube (see Fig. 3). This makes it easy to assemble and remove the parts. The pivoted piece 11 is provided with engaging parts 14 which engage lugs 15 on the locking part 5 at the front side thereof. A spring engaging part 16 is loosely mounted on the controlling part 9 and engages lugs 15. These lugs have polished faces so as to facilitate the movement of the locking part. The spring is provided at its other end with a spring engaging part 17 slidable along the controlling part 9 and engaging the stop 18 on the coupler head. The controlling part 9 is provided with an elongated slot 19 through which passes a pin 20, to which is connected the controlling lever or handle 21. The controlling part 9 is provided at each side of the pin 20 with the lugs 22. Surrounding the pin 20 is an actuating piece 23 connected with the pin so as to rotate therewith, as by making the pin non-circular at the connecting points and having the engaging portions 24 adapted to engage the lugs 22. In the construction shown, the pin 20 is provided at its upper end with the elongated flattened portion 20^a, which fits in a slot 21^a in the handle 21 (see Figs. 1 and 5), the handle 21 being pivoted to the pin by the pivot 21^b. The handle may therefore be lifted so as to clear the confining pieces 1^a on opposite sides thereof (see Figs. 1 and 5). These confining pieces prevent accidental movement of the handle. I prefer to provide some means for limiting the movement of the handle by the pivot 21, as for example, by arranging the rear end 21^c so that it strikes the coupler head, or some part associated therewith, when the lever has been lifted sufficiently high to clear the parts 1^a as shown in dotted lines in Fig. 5. The weight of the lever 21 normally keeps it in position between the parts 1^a. It will be noted that the handle or lever 21 is located outside of the coupler head and at the top thereof and normally stands in the central position. The locking piece 5 is provided with the holding pawl 25, which is pivotally mounted on the pin 26 mounted in the cou-

pler head. Said pawl is provided with a controlling spring 27, one end of which engages the pawl, a portion of the spring engaging the coupler head. The locking part 5 is provided with the stop 29 which is engaged by the pawl 25 when the locking part is in its unlocked position, the pawl holding said locking part in this unlocked position against the pressure of the spring 8. The pawl and the coupling part, it will be noted, mutually act to limit the movement of each other. The pawl 25 is also provided with engaging faces 30 adapted to be engaged by the coupling part as it enters the coupler head so that the pawl may be moved thereby to release the locking part 5 and permit it to move to its coupling position. I prefer to also arrange the parts so that the engaging face 30 of the pawl is engaged by the coupling part as it is moved out of the coupler head so as to permit the free return of the locking part 5 to its coupling position. The forward movement of the locking part is limited by the stop 31 on the coupler head. In the construction shown, the lug 31 is at the bottom of the coupler head. There is a similar lug opposed to the lug 31, just above it, the coupling part 4 passing between these two lugs when it is moved to its coupling position. The locking part 5 engages these lugs and they project inwardly, preferably substantially flush with the top and bottom inner faces of the opening 6 in the locking part, or slightly above and below the top and bottom of said inner faces so that the coupling part will not strike the top and bottom walls of the locking part, that is, the portion of the locking part opposite said lugs. By this construction the coupling part will slide freely into the opening of the locking part. The coupler head is provided back of the pawl 25 with a projection 32, against which the pawl strikes when it is moved to its outward limit, thus providing a solid foundation against which it rests when in this position. This is particularly desirable when the pawl is moved against the stop by the coupling part striking it, thus helping to move the coupling part laterally to properly center the couplers. Each coupler head is provided with a stop 51, which stops the locking part 5 when it is moved to its unlocked position. The coupling part 4 is provided with a beveled face 33 and a second finished beveled face 33^a adapted to engage a finished beveled face 34 on the coupler head. The coupling part is also beveled at the top and bottom as shown at 35 (Fig. 7) and the coupler head has beveled faces 36 at the top and bottom of the opening into which the coupling part passes (see Fig. 8). At the top and bottom of the opening of the coupler head I provide the finished faces 39^c, which are substantially at right angles to the faces 39, and substantially parallel to the finished faces 39^b on the coupling part 4. These faces align the couplers vertically and insure the proper alignment of the air tubes. These various beveled faces insure the centering of the coupling part. The coupling part 4 also has a finished beveled pulling face 37 which engages a finished beveled pulling face 38 on the coupler head. The beveled face 37 on the coupling part and the beveled faces 38 on the coupler head are all substantially parallel, and the beveled faces 33 and 33^a on the coupling part and 34 on the coupler head are substantially parallel. The meeting faces 39 of the coupler heads are also finished surfaces. The parts are arranged so that when they come together a tight joint is made, there being substantially no relative movement between the two coupler heads after they are once coupled together. The ends of the air connections 41^a and 41^b for the brakes project through the wall 40 of the coupler head, that is, the wall containing the beveled face 38. These air connections are provided at their ends with the elastic washers or gaskets 41, the gaskets on the opposite coupler heads being brought together when the coupling is made and compressed so as to insure a tight coupling. The ends of these air connections are so located with relation to the coupling parts that they cannot be struck by these coupling parts as they are moving to and from their coupling positions. It will be noted that when the parts are in their coupling position the inner face 44 of the locking part 5 engages the face 45 of the associated coupling part 4. These faces are arranged so that the locking part as it moves further along the coupling part forces the coupling part over so as to more tightly force the pulling face 37 thereof against the pulling face 38 of the coupler head, thereby insuring a tight connection between the coupler heads. This result may be secured by forming the faces 44 and 45 so that they are non-parallel. If, for example, the face 45 is a curved face, then this result may be secured by forming this curve, not about the pin 7 as a center, but about a point a short distance ahead of this pin, that is, a point between the pin 7 and the coupling part 4. It will thus be seen that by this construction the face 45 is on a different curve from the path of the face 44, as it moves about the pin 7 as a pivot. This construction keeps the engaging faces of the coupler heads in close contact with each other, thereby preventng relative movement while the parts are in their coupling position, thus preventing wear of the parts. I prefer to provide means for automatically uncoupling the couplers. In the drawings I have illustrated one form of accomplishing this result. In this construction I provide means for automatcally moving the locking parts 5 when desired to dis-

connect them from the coupling parts 4 as illustrated in Figs. 3, 4, 6 and 7. This device consists of an air cylinder and suitable piston operatively connected with the locking part 5. The cylinder 50 is provided with the piston 51, to which is connected the engaging piece 52, which engages the engaging piece 53 engaging the pivoted piece 11, but separate therefrom. It will be seen that by letting air under pressure back of the piston 51, the piston will be moved forward so that the engaging part 52 will move the engaging part 53, thereby moving the pivoted part 11 and the locking part 5 to the position shown in dotted lines in Fig. 6. This releases the coupling part and permits the couplers to be disengaged. As herein shown, the cylinder 50 is set into the coupler head and is provided with a removable end 54, the parts being held in position by the bolts 55. Each coupler head is provided with an air connection 56 having a gasket 57 similar to the gaskets 41, the arrangement being such that when the two gaskets 57 are brought together in coupling the couplers, a continuous air connection between the cars will be provided. These air connections 56 are connected to a suitable air pipe 58 and they are connected by the connection 59 with the air cylinders 50. It will be seen that by controlling the air in these connections the air may be forced into the cylinders so as to automatically uncouple the couplers.

It will be noted that the uncoupling mechansim consisting of the cylinder and piston and associated parts is located inside of the coupler head and that the pivoted locking part with the receiving opening is also located inside of the coupler head so that this pivoted locking part adapts itself to this concealed enclosed and protected unlocking mechanism. This also saves parts, produces a cheaper and more effective construction, and reduces the lability to injury and breakage.

When the piston 51 and engaging part 52 are moved by the air pressure so as to move the forwarding part 53, said engaging part moves the locking part 5 and the controlling part 9 without moving the lever or handle 21, as under such conditions the controlling part 9 moves with relation to the pin 20 without moving said pin or the actuating piece 23 connected therewith. The slot 19 in the controlling part permits this movement. It will thus be seen that the locking part 5 may be moved either by the handle or by the automatic device independently without the one affecting the other. When the locking parts are unlocked so as to release the coupling parts 4 the coupler heads separated thus disconnecting the air pipe and permitting the air to exhaust from the cylinders 50. The springs 8 through the agency of the engaging parts 53 then move the pistons of the cylinders back to their initial position. It will be seen that if the locking part is then moved by means of the handle the piston will stay in this initial or retracted position and does not depend upon the engaging part 53 to hold it in this position, it being held in such position until the air enters the cylinder. It will further be seen that while the two cooperating coupler heads have independent unlocking mechanisms, these independent unlocking mechanisms are actuated by one operation, that is, by admitting air into the air pipe leading to the cylinders 50. When this air is let into this pipe and into these cylinders by this one operation, the two independent cylinders act upon their respective mechanisms and thus unlock the coupler heads. For purposes of illustration I have shown a valve 61 (see Fig. 7) for controlling the admission of air into the air pipe 58, said valve being controlled by the lever 62. This valve would be located at a point where the operator of the train can easily manipulate it. I prefer to make the faces on the coupling part and the opposed part of the coupler head non-parallel. Referring to Figs. 4 and 6, I prefer to make the opposied faces 34 and 33 inclined at a different angle from the faces 37 and 38, that is, non-parallel. I do not limit myself to any degree of inclination but in order to more clearly bring out this feature I may, for example, have the faces 34 and 33a inclined at an angle of 41 degrees and the faces 38 and 37 inclined at an angle of 45 degrees. This construction makes the coupling easier and prevents the coupling part from striking the corner 66, thus giving a clearance in coupling the coupler heads and preventing the battering of the points 66 of the coupler heads. These faces also bring the coupling parts 4 when in their coupling position in the center of the opening between the guide lugs 31 and prevent the bottom inner surface of the locking parts 5 from touching the top and bottom faces of the coupling parts 4. Only the finished inner end surface 44 of the locking part 5 will strike the coupling part at the surface 45 when the coupling is made.

I claim:

1. A car coupler comprising a hollow coupler head, a coupling part connected therewith, a pivoted locking part contained within said hollow coupler head, said locking part adapted to engage the coupling part of the adjacent coupler head, and a fluid actuated unlocking device for moving said locking part to its unlocked position, said unlocking device contained within said hollow coupler head between said locking part and the front end of the coupler head.

2. A car coupler comprising a hollow coupler head, a coupling part connected

therewith, a pivoted locking part contained within said hollow coupler head, said locking part adapted to engage the coupling part of the adjacent coupler head, a lever on the outside of the coupler head and connected with said locking part for moving it to its unlocked position, the connection between said lever and said locking parts being a movable connection which permits the locking part to move without moving said lever when pressure is applied directly to said locking part tending to move it toward its unlocking position, a fluid actuated unlocking device for moving said locking part to its unlocked position, said lever and fluid actuated unlocking device adapted to be operated separately without interfering with each other.

3. A car coupling device comprising two hollow coupler heads, a coupling part connected with each head, a pivoted locking part contained within each hollow coupler head, each adapted to engage the coupling part of the adjacent coupler head, independent unlocking devices for moving the locking parts to their unlocked position, said unlocking device contained within said hollow coupler head between said locking part and the front end of the coupler head, and means for actuating both of said unlocking devices by a single operation to cause them to move said locking parts to their unlocked position.

4. A car coupling device comprising two hollow coupler heads, a coupling part connected with each head, a pivoted locking part contained within each hollow coupler head, said locking parts each provided with a receiving space adapted to receive the coupling part of the adjacent coupler head, independent unlocking devices each having an actuating part located in the plane of the receiving space of the associated locking parts for moving the locking parts to their unlocked position, said unlockng devices each provided with an engaging part opposite the receiving space of the associated locking part and engaging a portion of said locking part, and a single controlling device for controlling both of said unlocking devices.

5. A car coupling device comprising two hollow coupler heads, a coupling part connected with each head, a pivoted locking part contained within each hollow coupler head, said locking parts each provided with a receiving space adapted to receive the coupling part of the adjacent coupler head, independent automatic unlocking devices each having an actuating part located in the plane of the receiving space of the associated locking parts for moving the locking parts to their unlocked position, said unlocking devices located within the hollow coupler heads, each comprising an air cylinder connected with each coupler head, a piston in each air cylinder, a connection between each piston and the locking part of the coupler head with which it is associated, said connection comprising an engaging part which spans a portion of the receiving space of the locking part with which it is associated, said engaging part engaging portions of the locking part above and below said receiving space, whereby when the pistons are moved the locking devices are moved to their unlocked positions, an air connection communicating with both of said cylinders and leading to a source of air supply, a valve in said air connection adapted when opened to let air into both of said cylinders to cause them to act to move the locking parts to their unlocked position.

6. A car coupling device comprising two hollow coupler heads, a coupling part connected with each head, a pivoted locking part contained within each hollow coupler head, each locking part adapted to engage the coupling part of the adjacent coupler head, independent fluid actuated unlocking devices for moving the locking parts to their unlocked position, means for actuating both of said fluid actuated unlocking devices by a single operation to cause them to move said locking parts to their unlocked position, and a lever on the outside of each coupler head and operatively connected with the locking part of the coupler head with which it is associated so as to move said locking parts to their unlocked positions, the connection between said lever and said locking part being a movable connection which permits the locking part to move without moving said lever when pressure is applied directly to said locking part to move it toward its unlocking position whereby said levers and said automatic unlocking devices are adapted to be independently used without interfering with each other.

7. A car coupler comprising a hollow coupler head, a coupling part connected therewith, a pivoted locking part contained within said hollow coupler head, said locking part provided with a receiving opening adapted to receive the coupling part of the adjacent coupler head, an air cylinder contained within said hollow coupler head, a piston in said air cylinder, and a connection between said piston and said locking part, a portion of said connection engaging the locking part between its pivot and that portion of the receiving opening therein into which the coupling part and the adjacent coupler is received whereby when the piston is moved by the pressure of the air the hollow locking part is moved from the coupling part of the adjacent coupling so as to unlock it from said coupling part.

8. A car coupler comprising a hollow coupler head, a coupling part connected there-

with, a locking part contained in said hollow coupler head and adapted to engage the coupling part of the adjacent coupler head, said locking part extending cross-wise of the coupler head and being provided with a receiving space adapted to receive the coupling part of the adjacent coupler head, an unlocking device for moving said locking part to its unlocked position, said unlocking device comprising a movable part on the inside of the coupler head to which power is applied and which extends cross-wise of the coupler head, and a connection between the movable part and the locking part, said connection engaging the locking part near the end of said receiving space.

9. A car coupler comprising a hollow coupler head, a coupling part connected therewith, engaging faces on opposite sides of said coupling part, said engaging faces being inclined at different angles, the adjacent coupler head having co-operating engaging faces which are also inclined at different angles and which co-operate with the said engaging faces of said coupling part.

10. A car coupler comprising a hollow coupler head, a coupling part connected therewith, a pivoted locking part contained within said hollow coupler head, said locking part adapted to engage the coupling part of the adjacent coupler head, a lever outside of said hollow coupler head, a pin mounted in the coupler head, a pivotal connection between said lever and said pin, a connection between said pin and said pivotal locking part, stops on opposite sides of said lever, which prevent the lever from being moved laterally until it is moved about its pivotal connection to move it out of the path of said stops, and a limiting device for limiting the movement of said lever about its pivotal connection.

11. A car coupler comprising a hollow coupler head, a coupling part connected therewith, a pivoted locking part contained within said hollow coupler head, said locking part adapted to engage the coupling part of the adjacent coupler head, a lever outside of said hollow coupler head, a pin mounted in the coupler head, a pivotal connection between said lever and said pin, a limiting device for limiting the movement of said lever about its pivotal connection, and a connection between said pin and said locking part by means of which the locking part may be moved when the lever is moved said connection permitting the locking part to be moved independent of said lever.

12. A car coupler comprising a hollow coupler head, a coupling part connected therewith, a locking part contained in said hollow coupler head and adapted to engage the coupling part of the adjacent coupler head, an automatic unlocking device for moving said locking part to its unlocked position, and a hand-operating unlocking device for moving said locking part to its unlocked position, whereby the locking part may be moved automatically or by hand.

13. A car coupler comprising a hollow coupler head, a coupling part connected therewith, a locking part contained in said hollow coupler head and adapted to engage the coupling part of the adjacent coupler head, an automatic unlocking device for moving said locking part to its unlocked position, and means for holding said locking part in its unlocked position when the coupler head is disengaged from its opposed coupler head.

In testimony whereof, I affix my signature in the presence of two witnesses this 6th day of October 1917.

HERBERT E. VAN DORN.

Witnesses:
MARION L. INGRAHAM,
LYDIA M. SYLVANUS.