F. C. REYNOLDS.

CAR COUPLING.

APPLICATION FILED JULY 12, 1909.

971,640. Patented Oct. 4, 1910.

2 SHEETS—SHEET 1.

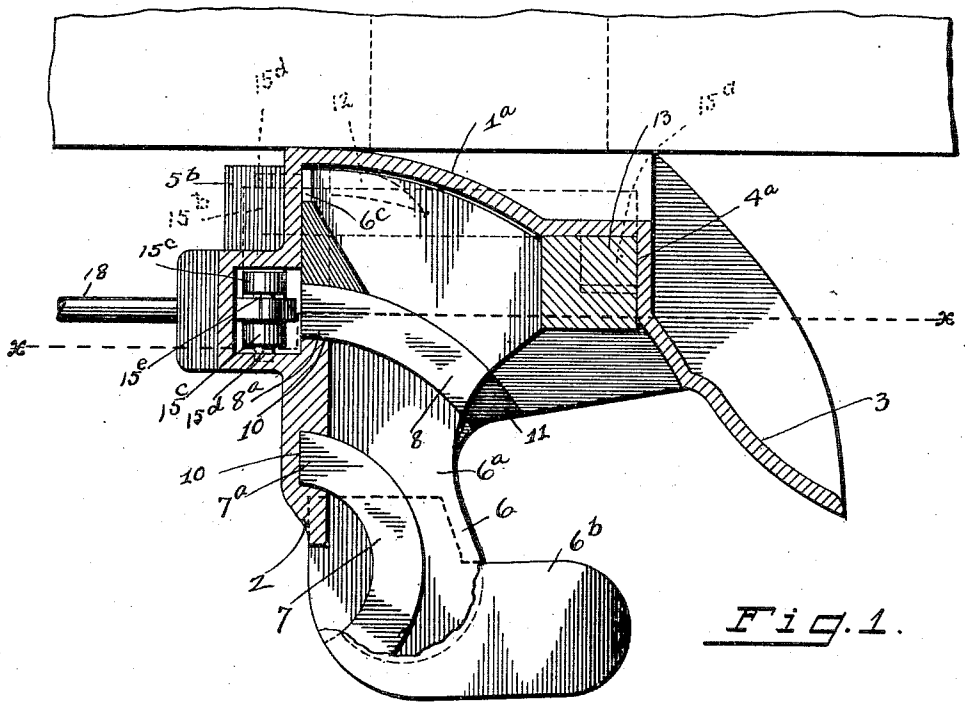


Fig. 1.

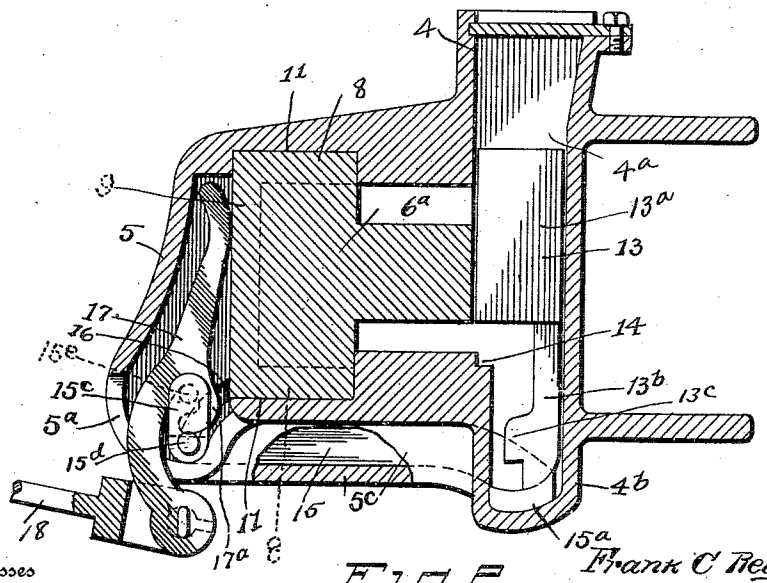


Fig. 2.

Witnesses

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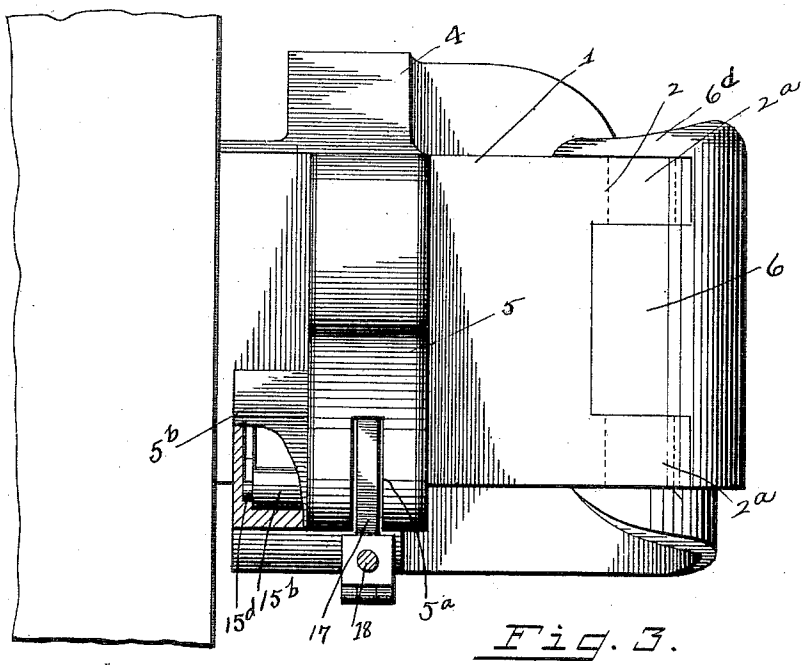


Fig. 3.

Fig. 4.

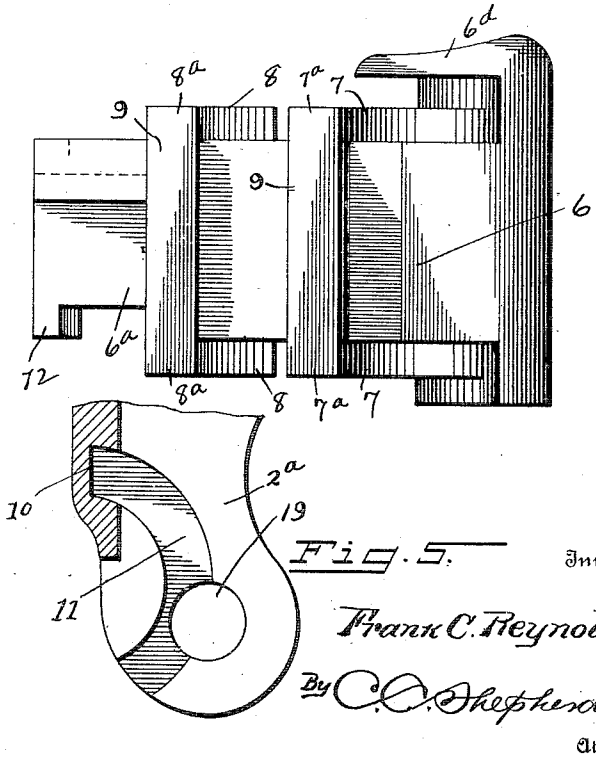





Fig. 5.

Witnesses

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# UNITED STATES PATENT OFFICE.

FRANK C. REYNOLDS, OF COLUMBUS, OHIO.

## CAR-COUPLING.

971,640. Specification of Letters Patent. Patented Oct. 4, 1910.

Application filed July 12, 1909. Serial No. 507,161.

*To all whom it may concern:*

Be it known that I, FRANK C. REYNOLDS, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful Improvements in Car-Couplers, of which the following is a specification.

My invention relates to the improvement of car couplers and has particular relation to that class of car couplers in which a swinging connection of the knuckle and coupler head is effected without the employment of a pivot pin.

The objects of my invention are to provide a car coupler comprising improved means for producing a pivotal or swinging connection of the knuckle and coupler head and to so connect said parts as to provide such engagement of the knuckle and coupler head when the knuckle is in its closed position as to afford increased resistance against an outward pull of the knuckle, thereby providing a strong durable and effective coupling; to construct my improved coupler without the employment of knuckle pins or bolts and at the same time provide improved means for preventing the knuckle from swinging out of the coupler head and becoming disconnected therefrom and to produce other improvements, the details of which will be more fully pointed out hereinafter. These objects I accomplish in the manner illustrated in the accompanying drawings, in which:

Figure 1 is a horizontal section of my improved coupler head, said section being taken immediately above the knuckle and showing the latter in plan, Fig. 2 is a sectional view on two planes indicated by the line $x$—$x$ on Fig. 1, Fig. 3 is a side elevation of my improved coupler with the knuckle in a closed position, Fig. 4 is an outer side elevation of the knuckle which I employ in the manner hereinafter described, and, Fig. 5 is a detail horizontal sectional view through the terminal portion of one of the coupler head jaws.

Similar numerals refer to similar parts throughout the several views.

In carrying out my invention, I construct the coupler head which is indicated at 1 of the usual general form, said head being internally recessed and having the usual forward bifurcation and opposing jaws 2 and 3. Rising above the rear portion of the coupler head and on one side of the center thereof, is a substantially square hollow guide extension 4, the guideway of which is continued downwardly as indicated at $4^a$ into the interior of the coupler head, said guideway being further continued through the lower portion of the coupler head and into a downwardly extending socket member $4^b$. From the inner side of this guideway, the rear wall of the coupler head which is indicated at $1^a$, is curved outwardly and rearwardly, as shown more clearly in Fig. 1.

In the construction of the coupler head body, I provide that side thereof which carries the jaw 2 with a laterally extending and substantially vertical housing 5, said housing being formed integral with the coupler head and having its enlarged rounded lower end portion, provided with a slotted opening $5^a$. The lower portion of this housing has extending rearwardly therefrom and communicating therewith, a short housing arm $5^b$, the rear portion of which communicates with a horizontal housing $5^c$ which extends beneath the lower portion of the coupler head and communicates with the rear side of the socket member $4^b$.

6 represents an angular coupler knuckle, which comprises the tail member $6^a$ and outer engaging member $6^b$ which extends substantially at right angles with said tail member. This knuckle, the tail of which is adapted to swing to the position shown in the drawing within the coupler head, when the knuckle is closed, has formed with its upper and lower side two opposing ribs 7 and 8, these ribs describing arcs of concentric circles and the inner ribs 8 crossing the knuckle tail, while the outer ribs 7 extend from the outer or long side of the knuckle head and do not cross said knuckle or its tail transversely. Each of the ribs 7 and 8 has its inner terminal portion extended as indicated at $7^a$ and $8^a$ beyond the outer side of the knuckle tail to meet vertical laterally projecting ribs 9, which are formed between said upper and lower rib extensions on the outer side of the knuckle tail. These side rib projections 9 and the extensions $7^a$ and $8^a$ of the upper and lower ribs are adapted to engage correspondingly shaped recesses 10 formed in the inner vertical wall of the coupler head. The upper and lower curved ribs 7 and 8 fit slidably in correspondingly shaped recesses 11 which are formed in the upper and lower portions of the coupler head. On the inner side of

the upper rib 8 and between the latter and the end of the tongue, the outer side of the tongue is provided with an upwardly projecting flange $6^e$, while on the lower side of the end portion of the knuckle tail is formed a downwardly projecting lug 12 which extending in the general direction of the width of the knuckle tail, presents an inclined outer surface as shown more clearly in dotted lines in Fig. 1.

Within the pin-way $4^a$—$4^b$, I provide a vertically movable locking pin 13, which comprises a squared upper portion $13^a$ from the lower side and rear portion of which extends downwardly a stem member $13^b$, the latter having its lower end curved, as shown, and having its inner side formed near its lower end with a projecting lug $13^c$. The floor of the coupler head at its junction with the pin-way, is formed with a recess shown at 14, with which when the locking pin is elevated, the lower side of the lug $13^c$ is adapted to engage.

15 represents a substantially horizontal pin elevating bar, which lies in the lower horizontal housing $5^c$, said bar having at one end a short forwardly projecting arm $15^a$, the upper surface of which is curved and which is adapted to form a support for the curved lower end of the pin stem $13^b$. At its remaining end, the bar 15 is provided with a somewhat longer forwardly extending arm indicated in dotted lines in Fig. 1 at $15^b$. The outer portion of this arm which extends within the lower portion of the side housing 5 of the coupler head, has extending upwardly therefrom, two lugs $15^c$. Each end of the arm $15^b$ is provided with a short bearing extension $15^d$ and which bear movably in curved recesses formed respectively in the inner wall of the outer end of the housing member $5^b$ and in the inner wall of the forward side of the housing 5, one of said recesses being indicated at 16 in Fig. 2 of the drawing. The upper ends of the lugs $15^c$ are connected by a short pin $15^e$ and over this pin is hooked the inwardly and thence outwardly curved hook finger $17^a$ of a lever 17, the lower portion of which extends through the opening $5^a$ of the housing 5 and the upper curved end portion of which is adapted to contact with the outer surface of one of the vertical rib members 9 of the knuckle. The lower end of the lever 17 is suitably connected with one end of an operating rod 18, which extends outward from the side of the coupler and may be suitably supported from the car frame.

As shown more clearly in Fig. 5 of the drawing and in dotted lines in Fig. 3 thereof, I may provide the upper and lower arms $2^a$ of the bifurcated jaw 2 with oppositely located vertical openings 19, which may be utilized for the reception of an ordinary knuckle pin in case the knuckle herein shown and described should become broken. It will be observed, however, by reference to Figs. 3 and 4 of the drawing, that I form the usual upper side extension of the outer end of the knuckle, with a horizontally extending flange $6^a$, which covers the upper end of the pin opening $2^a$.

As will readily be understood by reference to the drawing, the knuckle when thrown inward to its closed position, has the side of the inner end of its tail portion in contact with the inner side of the enlarged head $13^a$ of the locking pin 13, the latter being in its lowered position and operating to prevent an outward swinging movement of the knuckle. In order to release the knuckle, a straight outward pull is imparted to the operating rod 18, which results first in a slight upward movement of the lever 17 causing the upper end of said lever to move into contact with the upper end of the housing 5, in which movement it is obvious that the lever hook finger $17^a$ will move upward on the pin $15^e$. A continued pull on the operating rod 18, results through the engagement of the hook finger $17^a$ with said pin $15^e$, in turning the arm $15^b$ outward in its bearings and in raising the forward portion of the bar 15, thereby lifting the pin 13 until the shoulder formed by the lug $13^c$ is in position to drop into engagement with the recess 14 of the floor of the coupler head. The inward movement of the pin necessary to produce the engagement of its lug with the recess as described, is due partly to the fact that the end of the bar 15 swings in the arc of a circle and partly to the fact that the lower end of the pin stem is formed with a rounded incline which bears on a correspondingly shaped surface of the bar arm $15^a$.

It will be observed by reference to the drawing, that the outer wall of the pin-way extension 4 is inclined outwardly, thus permitting the enlarged head of the pin to incline outward as the stem is moved inward. The outward pull on the operating rod being continued, it is obvious that the upper portion of the lever 17 will move inward, forcing the tail of the knuckle to swing outward to the open position beneath the enlarged head portion $13^a$ of the pin 13. As the knuckle approaches its outward position, however, it is obvious that the inclined face of the knuckle lug, will by contact with the pin head move the latter outward until the pin stem shoulder $13^c$ is out of engagement with the recess 14, thus supporting the pin by engagement of its head, with the upper side of the knuckle, in position to drop vertically within its way when the knuckle is again closed inward past said pin. It will be understood that the outward swinging movement of the knuckle, will be limited by the contact of the flange or shoulder $6^c$ of the knuckle, with the pin, thereby obviating

any tendency of the knuckle to become completely detached from the coupler head.

One of the most important objects of my present invention, is to provide a coupler construction in which the knuckle so engages the coupler head, as to provide an increased resistance against an outward pull of the knuckle. This I accomplish by providing the ribs 7 and 8 with the extensions $7^a$ and $8^a$ and providing the side ribs 9, which engage the wall of the coupler head.

From the foregoing description, it will be seen that simple and efficient means are herein provided for accomplishing the objects of the invention, but while the elements shown and described are well adapted to serve the purposes for which they are intended, it is to be understood that the invention is not limited to the precise construction set forth, but includes within its purview such changes as may be made within the scope of the appended claim.

What I claim, is:

In a car coupler, the combination with a recessed coupler head having a vertical pin-way formed therein and curved grooves in the upper and lower portions of the coupler head, of an angular knuckle provided with curved ribs on its upper and lower side and vertical ribs on one side of said knuckle which connect with the extension of said curved ribs and which are adapted to enter recesses in the coupler head side wall, a vertically movable locking pin in said pin-way adapted when lowered to retain the knuckle in a closed position, and means for raising said pin.

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

FRANK C. REYNOLDS.

Witnesses:
D. E. BEATTIE,
A. L. PHELPS.