No. 728,049. PATENTED MAY 12, 1903.

C. A. TOWER.

CAR COUPLING.

APPLICATION FILED MAR. 17, 1902.

NO MODEL. 3 SHEETS—SHEET 1.

Fig. 1.

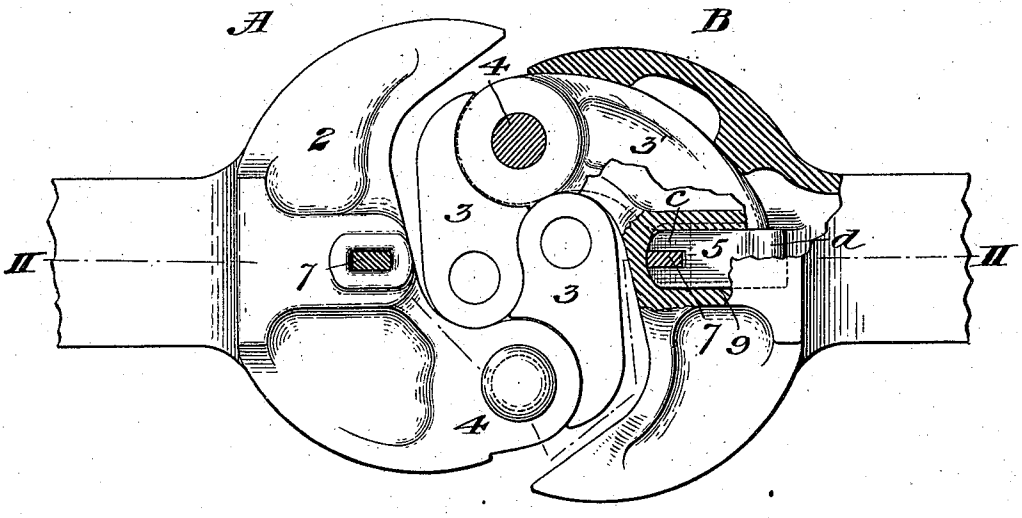
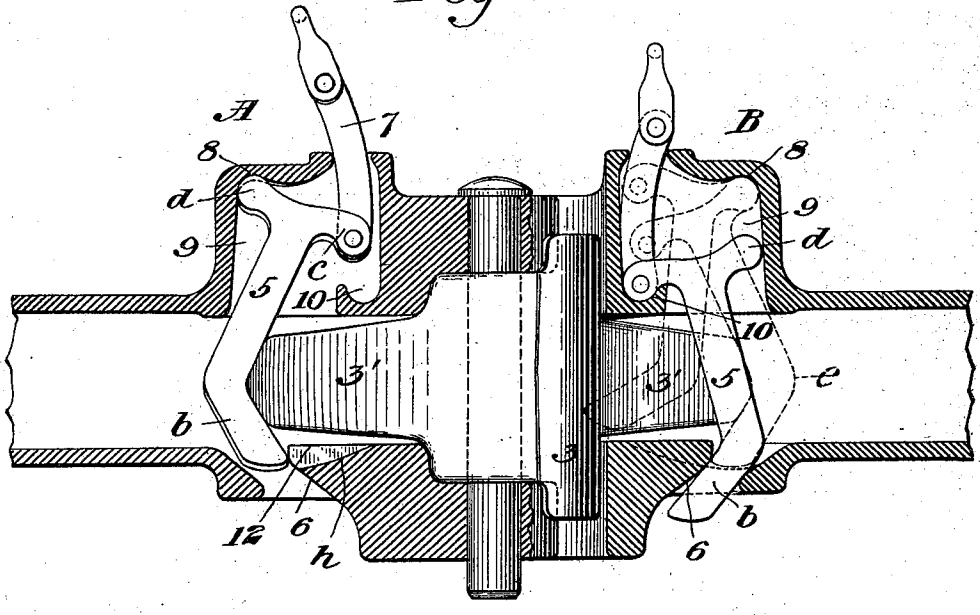


Fig. 2.



WITNESSES

Thomas W. Bakewell

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NO MODEL. 3 SHEETS—SHEET 2.

Fig. 3

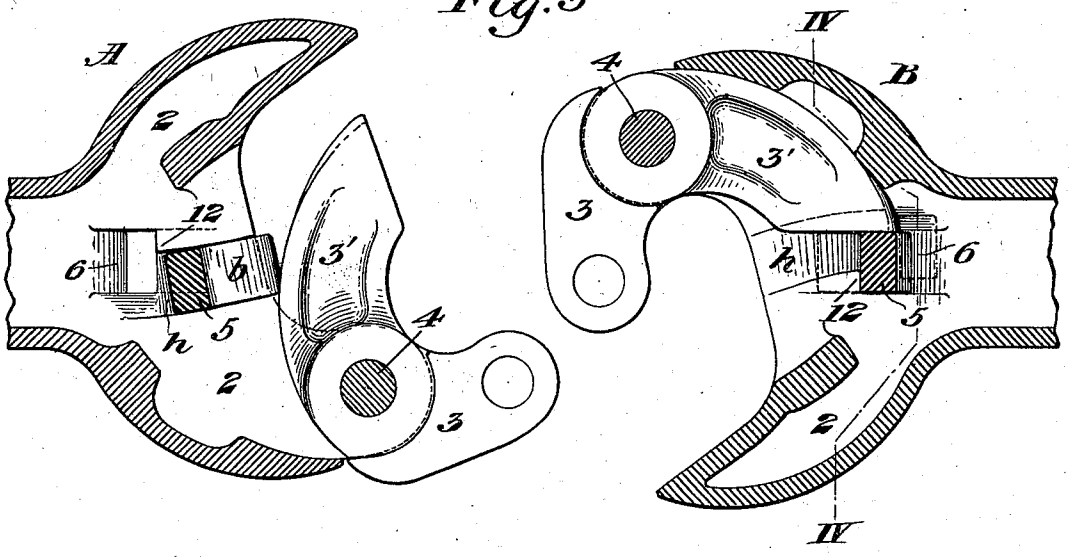


Fig. 5.

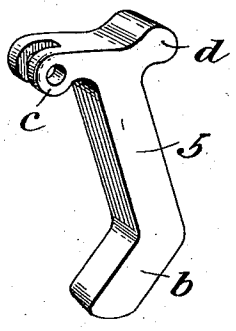
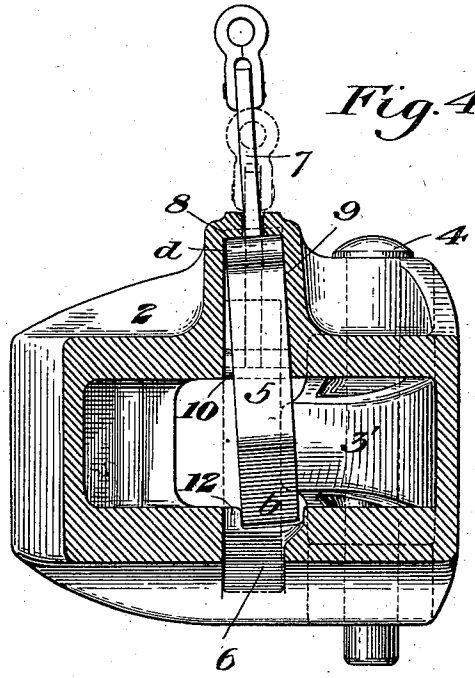


Fig. 4.



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NO MODEL. 3 SHEETS—SHEET 3.

Fig. 8.

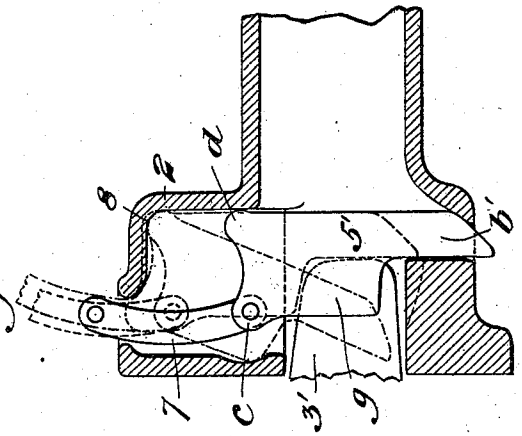


Fig. 7.

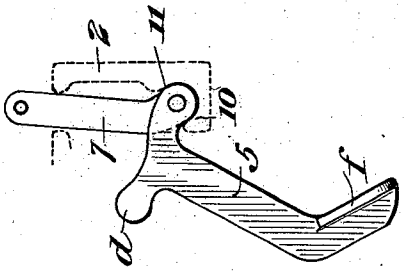
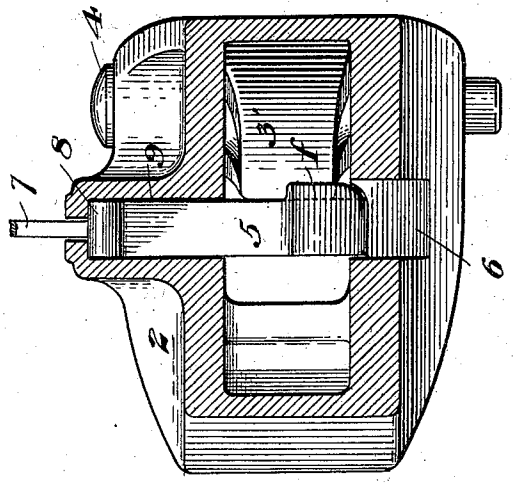


Fig. 6.



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No. 728,049. Patented May 12, 1903.

UNITED STATES PATENT OFFICE.

CLINTON A. TOWER, OF CLEVELAND, OHIO, ASSIGNOR TO THE NATIONAL MALLEABLE CASTINGS COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

CAR-COUPLING.

SPECIFICATION forming part of Letters Patent No. 728,049, dated May 12, 1903.

Application filed March 17, 1902. Serial No. 98,473. (No model.)

To all whom it may concern:

Be it known that I, CLINTON A. TOWER, of Cleveland, Cuyahoga county, Ohio, have invented a new and useful Car-Coupler, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

In the drawings, in which I show what I deem to be the preferable embodiments of my invention, Figure 1 is a plan view of two coupler-heads A B having my improved devices shown in locked position, one of the coupler-heads being partly in horizontal section for purposes of illustration. Fig. 2 is a vertical longitudinal section on the line II II of Fig. 1, the coupler A being shown with its locking and opening piece in lock-set position and the other coupler B being shown with its locking and opening piece in locked position. In coupler B the other positions of said piece—namely, the lock-set position and the thrown positions—are indicated by dotted lines. Fig. 3 is a horizontal section of two of my improved couplers separated from each other, the coupler A having its knuckle thrown forward and the coupler B having its knuckle locked. Fig. 4 is a vertical cross-section on the line IV IV of the coupler B in Fig. 3. Fig. 5 is a perspective view of the locking and opening piece. Figs. 6, 7, and 8 illustrate modifications of my invention.

The object of my invention is to provide a coupler with a locking and opening piece of simpler construction and easier of operation than heretofore and which will enable the coupler to be made of great strength in proportion to the weight of the metal used therein. These characteristics which I obtain by my invention are of the greatest practical importance, for the reason that the couplers when in use are subjected to severe strains and often to careless use. Safety and certainty of operation require them to be easily operated and to have as few parts as possible.

In the drawings, 2 represents the coupler-head, and 3 is the knuckle, whose tail 3′ extends rearwardly from the pivot-pin 4, the front side of the tail or the end portion thereof being preferably approximately parallel with the central line of the draw-bar when the knuckle is locked.

The locking and opening piece 5 in so far as its locking function is concerned is in the nature of a pin, which extends on the front side of the tail of the knuckle and in locking has a bearing against the coupler-head extended both above and below the knuckle. At its lower end is a guiding portion *b*, which is inclined forwardly and is adapted to fit in a correspondingly-inclined hole 6 in the floor of the coupler. Its upper end or head has a forward projection *c* or is otherwise suitably shaped for pivotal attachment to a lifting-link 7, and at the rear of the head is a bearing *d*, which is adapted to engage a fulcrum 8 at the top of the recess 9 of the coupler-head, in which the piece 5 is set. This recess is preferably nearly of the same width as the piece 5, so that it may guide and steady the latter. At the lower part of the recess 9 is a shoulder 10, which is adapted to receive the forward portion of the head of the piece 5 when it is in its locked position.

The operation is as follows: The parts being in the position shown at the coupler B in Fig. 2, the knuckle is closed, and the locking and opening piece fits in front of it, with its guiding portion *b* in the hole 6. The knuckle is thus held locked. If it be desired to unlock the knuckle and to swing it open, the operator lifts the link 7, thus causing the locking and opening piece to rise. During its first motion the guiding portion *b* at its lower end causes it to move rearwardly until it reaches the position indicated by the dotted lines *e*, when it has passed back of the path of the tail of the knuckle and has left the latter free to swing open and its head has engaged the fulcrum 8 at the top of the coupler-head. This fulcrum 8 is inclined or beveled laterally, as shown in Fig. 4, so that when the piece bears thereon it will tip laterally in a direction transverse to the length of the coupler-head to a sufficient extent to bring the locking and opening piece somewhat to the rear of the tail of the knuckle, as shown by dotted lines *e* in Fig. 3 and by full lines in Fig. 4. The effect of this is to bring the piece 5 into knuckle-throwing position and also to

free it from the path of a stop 12, which is formed on the coupler-head and is adapted to prevent throwing of the piece 5 until it is at the back of the knuckle. Continued lifting of the link 7 will cause the piece 5 to tip forwardly on the fulcrum 8 and to move the knuckle into open position, as shown by full lines at the coupler A of Fig. 3 and by dotted lines at the coupler B of Fig. 2. The operator having thus opened the knuckle can allow the locking and opening piece to drop, whereupon it will be restored to the position shown by full lines on the coupler B of Fig. 2. When the knuckle is next swung into closed position, its tail will engage the shank of the piece 5 and, pushing it rearwardly, its guiding portion *b* will cause it to rise and to move backwardly sufficiently to allow the tail of the knuckle to pass, whereupon it will drop again into the hole 6 and will hold the knuckle in locked position.

If it be desired to lift the piece 5 only far enough to unlock the knuckle without throwing it open and to leave the piece 5 in lock-set position, so that the knuckle can be moved open freely when the car to which it is attached is moved away from another car with which it is coupled, the operator simply lifts the piece 5 into the position shown by dotted lines *e* of the coupler B of Fig. 2 and the full lines in the coupler A of said figure, whereupon the inclination of the fulcrum 8, as above explained, will cause the piece 5 to move laterally to a small extent. On releasing the lifting-link the piece 5 will bear against the end of the tail of the knuckle, as shown in the coupler A of Fig. 2, and will be held against it by friction. There is, however, no locking engagement of the piece 5 with the coupler-head, and the knuckle is free to move open when the cars are drawn apart.

The floor of the coupler-head is preferably provided with a longitudinal groove *h*, in which the lower end of the piece 5 may rest and which serves to guide it into locked position when the knuckle is moved back.

In Figs. 6 and 7 I show a modified construction of my invention, in which the lateral beveling of the fulcrum 8 or other means for causing the piece 5 to move laterally is rendered unnecessary by extending the end portion *b* of the piece 5 so that it shall have a lateral projection *f*, which when the piece 5 is tipped forwardly after engagement with the fulcrum 8 will engage the end of the tail of the knuckle and will start it on its outward motion and will thus constitute the means for imparting the initial engagement of the locking and opening member with the knuckle. In Fig. 7 I also show the shoulder 10 provided with a recess or notch 11, into which the forward portion of the head of the piece 5 can fit when it is in locked position, at which time it will prevent upward creeping of the piece 5, for any tendency to such creeping will simply cause the forward portion of the head to bear more firmly within the recess. At the same time the recess presents no obstacle to the lifting of the piece 5 by the lifting-link.

In Fig. 8 I show another modification of my invention, in which the backward motion of the locking and opening piece 5 is rendered unnecessary. In this case the piece which I mark 5′ has portions *c* and *d*, as above explained; but its lower portion *b*′ is or may be straight, but made of less breadth than the upper or locking portion *g*. When the parts are in locked position, the tail of the knuckle will bear against the locking portion *g*. To unlock the knuckle, the piece 5′ is lifted until the portion *g* has cleared the tail of the knuckle and the portion *d* has engaged the fulcrum 8′ and has caused the piece 5′ to tip laterally somewhat. Continued lifting of the link 7 will cause the piece 5′ to tip forwardly and its portion *b*′ to move the knuckle into open position.

It will be noticed with reference to the figures on the first two sheets of the drawings and also with reference to Fig. 5 that the knuckle locking and opening piece when in locking position bears against the front of the tail of the knuckle, lifting it, frees it from the tail, and causes it to move laterally somewhat opposite to the rear of the knuckle, and continued lifting will tip the said piece, cause it to bear upon the rear of the knuckle, and move it open.

In the figures on the first two sheets of the drawings the knuckle locking and opening piece has also a backward motion when it is lifted which frees it from the path of the tail of the knuckle. It then moves laterally somewhat to bring it opposite to the rear of the tail, and it then tips forwardly and opens the knuckle.

The skilled mechanic will be able to modify the parts of my coupler in various ways, so as to accomplish the results above stated substantially as I accomplish them by the device shown in the drawings. The locking and opening piece is easy in all its motions and throws the knuckle forwardly to as great extent as desired, and the setting of the lock is performed in a simple and effective manner. The forwardly-inclined guiding portion *b* of the piece 5 is desirable not only in performing the functions above stated, but also in preventing the tendency of the piece 5 to creep upwardly. It acts in this way singly and also in coöperation with the recess 11 when the latter is employed.

One of the important and novel features of my coupler consists in the use of a locking and opening piece whose locking and opening member in locking fits in front of and locks the tail of the knuckle and when raised first frees and then by a continued movement opens the knuckle, the successive operations being functions of the same member, which preferably is also arranged to have the capacity of setting itself in unlocked position while the knuckle is still closed.

The main member of the lock, therefore, has three functions, and the same part which locks the tail of the knuckle also operates to throw it open and, if desired, sets itself in unlocked position when the knuckle is still closed. The simplification of construction and strength which I thus secure will be appreciated by those skilled in the art.

I obtain a large locking-surface of the piece 5 against the tail of the knuckle and against the coupler-head. I can also employ a knuckle-tail sufficiently long to prevent jamming of the knuckle when two couplers are brought together each with the knuckle in open position. Such jamming is likely to occur in some couplers heretofore in use.

I claim—

1. A coupler having a longitudinally-movable locking and opening piece, means for directing it backwardly to free the knuckle, and means for tipping it forwardly to move the knuckle open; substantially as described.

2. A coupler having an upwardly-movable locking and opening piece, means for directing it backwardly to free the knuckle, and means for tipping it forwardly to move the knuckle open; substantially as described.

3. A coupler having a locking and opening piece constructed to fit in locking position on the forward side of the knuckle, said piece having an upward motion, and means for directing it in said motion laterally, to move back of the knuckle the same portion of the piece which was on the forward side of the knuckle, and means for tipping it forwardly to move the knuckle open; substantially as described.

4. A coupler having a locking and opening piece, said piece having an upward motion, means for directing it in said motion backwardly to free the knuckle, means for moving it laterally back of the knuckle-tail, and means for tipping it forward to move the knuckle open; substantially as described.

5. A coupler having a locking-piece constructed to fit in locking position on the forward side of the knuckle, said piece being movable upwardly to free the knuckle, and a fulcrum adapted to engage said piece and to tip it transversely of the length of the draw-bar into a lock-set position at the end of the tail of the knuckle; substantially as described.

6. A coupler having a locking and opening piece, said piece having a forwardly-inclined guiding portion at its lower end fitting in a guiding-hole in the floor of the coupler, and constructed to direct the said piece backwardly, and a fulcrum constructed to engage the upper end of the piece to tip it forwardly; substantially as described.

7. A coupler having a locking and opening piece, said piece having a forwardly-inclined guiding portion at its lower end fitting in a guiding-hole in the floor of the coupler and constructed to direct the said piece backwardly, and a fulcrum constructed to engage the upper end of the piece to tip it laterally and then forwardly; substantially as described.

8. A coupler having a locking and opening piece, said piece having a forwardly-inclined guiding portion at its lower end fitting in a guiding-hole in the floor of the coupler, and constructed to direct the said piece backwardly, and a fulcrum constructed to engage the upper end of the piece to tip it forwardly, said piece having at the forward portion of its head a lifting-link and a fulcrum-bearing at a rearward portion; substantially as described.

9. A coupler having a locking and opening piece, said piece having a forwardly-inclined guiding portion at its lower end fitting in a guiding-hole in the floor of the coupler and constructed to direct the said piece backwardly, and a fulcrum constructed to engage the upper end of the piece to tip it forwardly, the bearing on said fulcrum being laterally inclined; substantially as described.

10. A coupler having a locking and opening piece, said piece having a forwardly-inclined guiding portion at its lower end fitting in a guiding-hole in the floor of the coupler and constructed to direct the said piece backwardly, and a fulcrum constructed to engage the upper end of the piece to tip it forwardly, said piece having at a forward portion of its head a lifting-link and a fulcrum-bearing at a rearward portion, the bearing on said fulcrum being laterally inclined; substantially as described.

11. A coupler locking and opening piece having its lower end inclined forwardly when in locking position, and having at its upper end an attachment for a lifting-link and a fulcrum-bearing; substantially as described.

12. A coupler having a locking and opening piece, said piece having at its lower end a guiding portion constructed to direct it rearwardly, a lifting device, and a locking-recess in the coupler-head forward of the locking and opening piece constructed to receive the head thereof and to hold it in locked position; substantially as described.

13. A coupler having a knuckle, the front side of whose tail when closed extends at its end portion in a direction lengthwise of the draw-bar, a locking and opening piece whose locking and opening member fits in locked position against said front side of the tail, said locking and opening piece being movable upwardly to free the knuckle, and having a fulcrum-bearing at its upper portion adapted to tip said member to move the knuckle open after the knuckle has been freed; substantially as described.

14. A coupler having a knuckle, the front side of whose tail when closed extends in a direction lengthwise of the draw-bar, a locking and opening piece whose locking and opening member fits in locked position against said front side of the tail, said locking and opening piece being movable upwardly, a guide directing said piece rearwardly to free the

knuckle, and a fulcrum-bearing at its upper portion adapted to tip it to move the knuckle open; substantially as described.

15. A coupler having a knuckle, the front side of whose tail when closed extends in a direction lengthwise of the draw-bar, a locking and opening piece whose locking and opening member fits in locked position against said front side of the tail on one side, and against the coupler-head above and below the knuckle on the other side; substantially as described.

16. A coupler having a locking and opening piece extending on the forward side of the tail of the knuckle when the knuckle is locked, and having a bearing on the coupler-head above and below said tail, and having at its lower end a guiding portion adapted to direct it rearwardly, and at its upper end a bearing portion constructed to engage the coupler-head and to tip thereon to move the knuckle open; substantially as described.

17. A coupler having a swinging knuckle and an upwardly-movable locking and opening piece having a member adapted in locking to fit in front of and against the knuckle, said member being adapted when raised to free the knuckle, and a fulcrum-bearing adapted in continued motion to tip the said member forwardly against the knuckle to open the same, and means for imparting to said member when raised an initial engagement with the knuckle; substantially as described.

18. A coupler having a swinging knuckle, and a locking and opening pin which when in locked position is in front of the knuckle-tail, and which at the lower portion of the same member is adapted to engage the knuckle when moving it open, said pin being movable upwardly in the coupler-head to free the knuckle, and being adapted to engage the coupler-head and to tip thereon to move the knuckle open; substantially as described.

In testimony whereof I have hereunto set my hand.

CLINTON A. TOWER.

Witnesses:
THOMAS W. BAKEWELL,
D. W. CALL.