J. G. ROBINSON.

CAR COUPLING.

APPLICATION FILED FEB. 16, 1910.

985,450.

Patented Feb. 28, 1911.

4 SHEETS—SHEET 1.

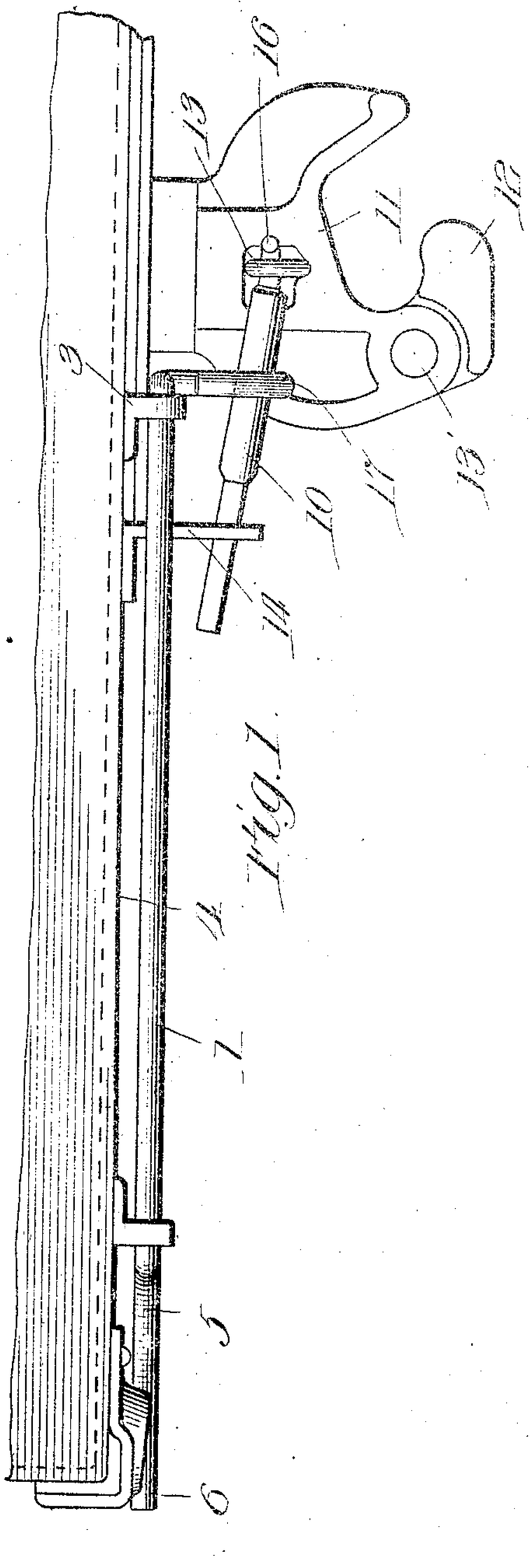


Fig. 1.

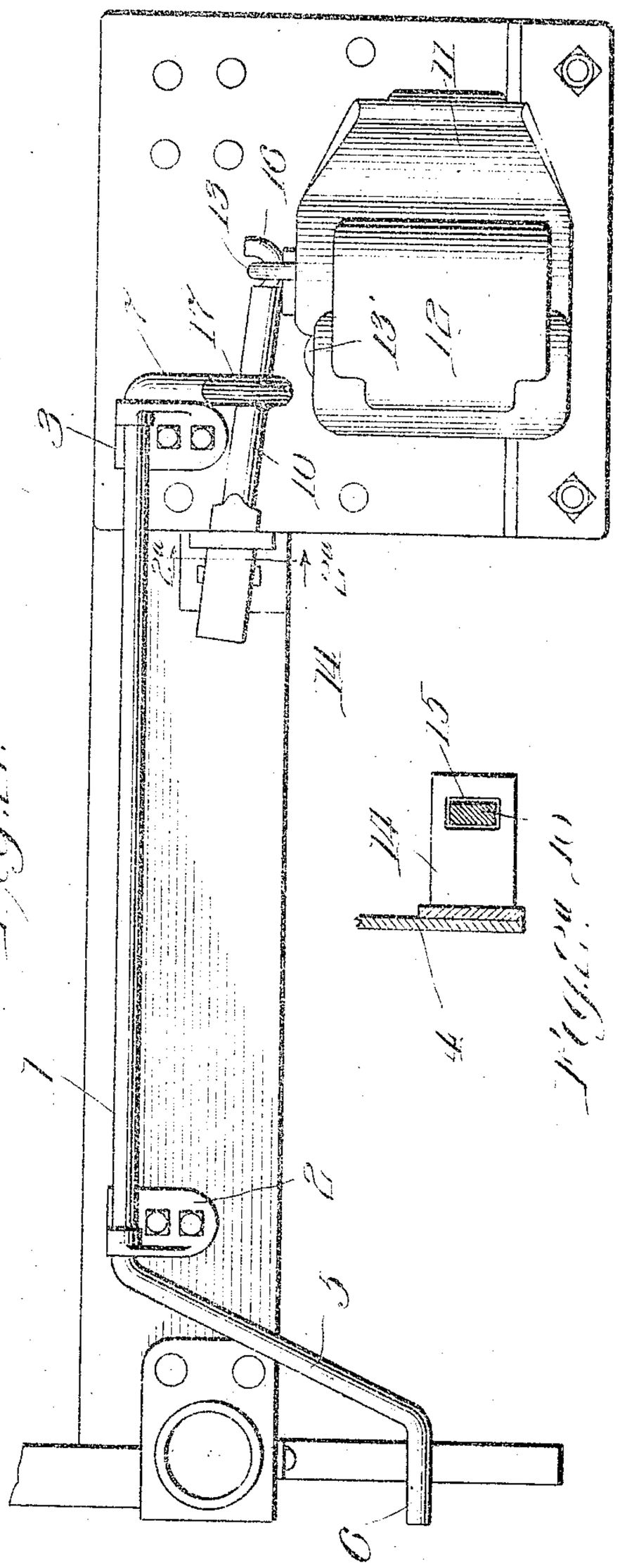


Fig. 2.

Fig. 3.

Witnesses:

Harry S. Gaither

Henry A. Parks

Inventor:

Jay. G. Robinson

by Sheridan, Robinson, Scott & Richmond

Attys.

J. G. ROBINSON.

CAR COUPLING.

APPLICATION FILED FEB. 16, 1910.

985,450.

Patented Feb. 28, 1911.

4 SHEETS—SHEET 2.

Fig. 8.

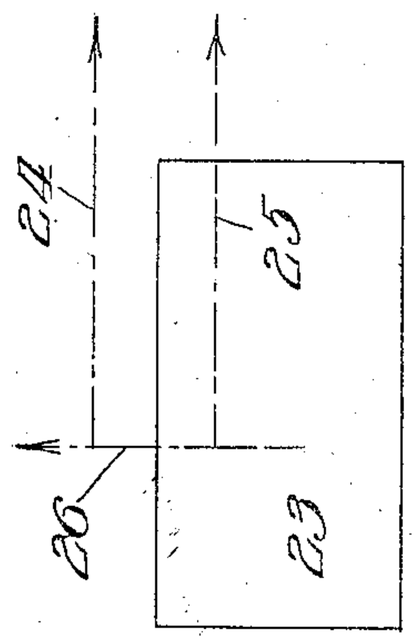


Fig. 9.

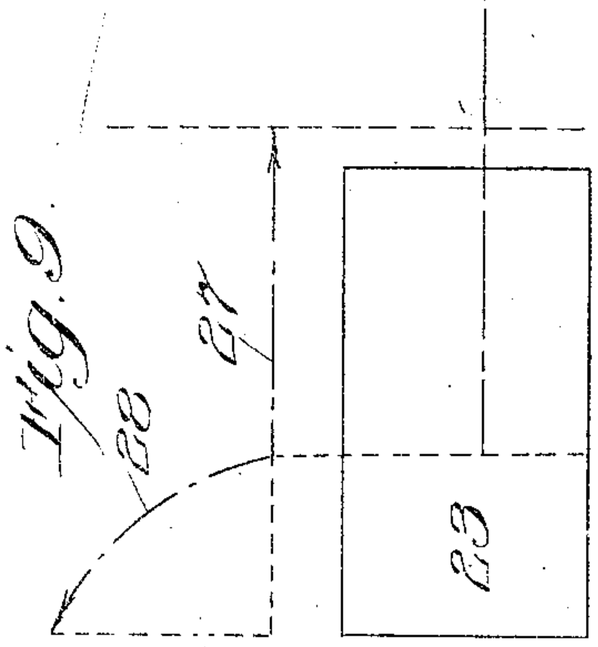


Fig. 7.

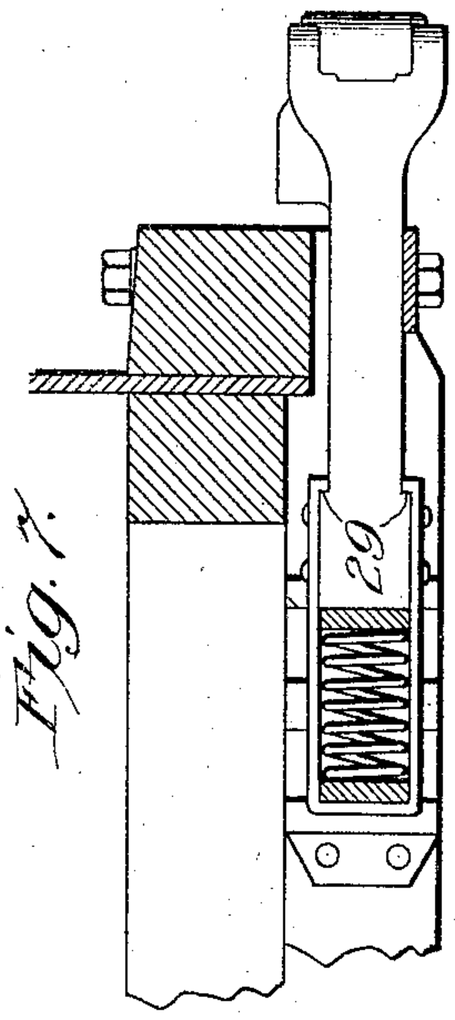


Fig. 5.

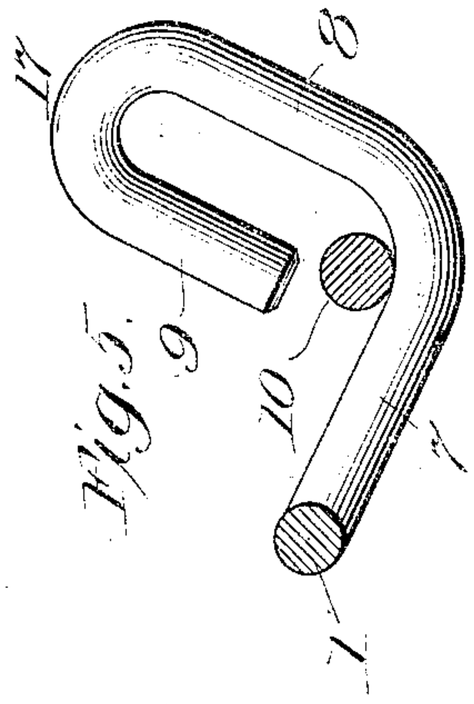


Fig. 6.

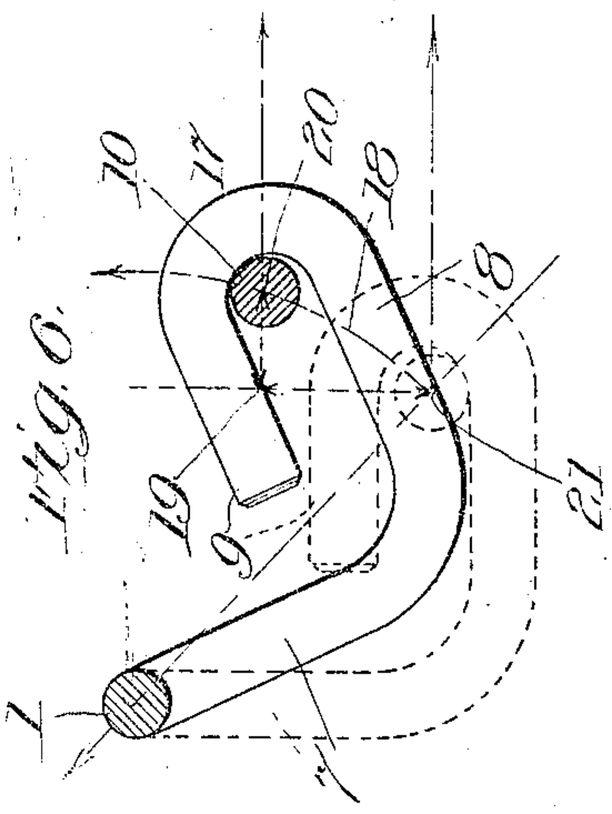


Fig. 3.

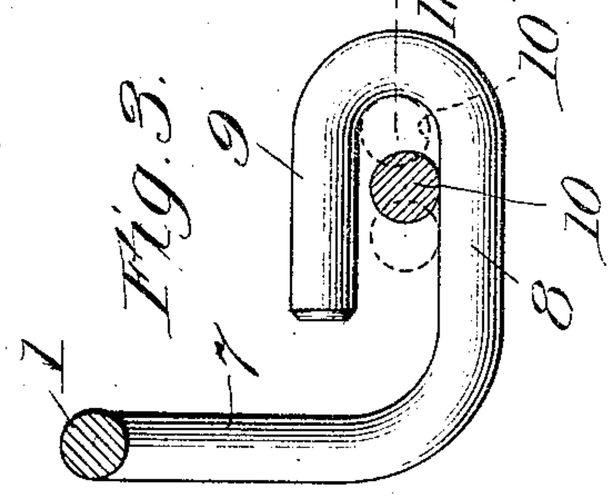
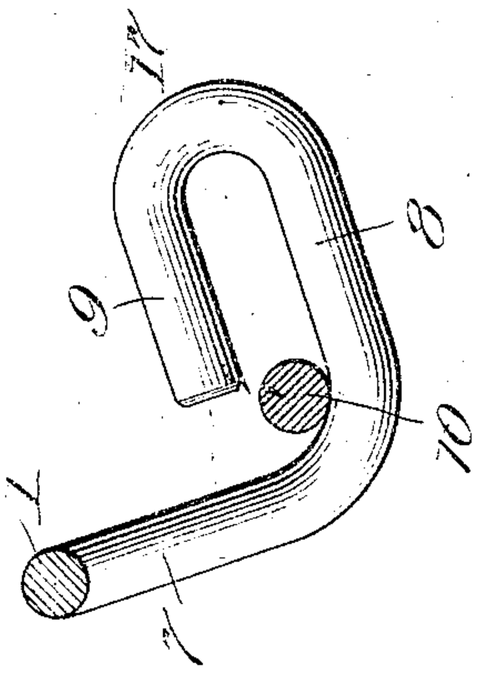


Fig. 4.



Witnesses:

Harry S. Gaither

Henry A. Parks

Inventor:

Jay G. Robinson

by Meriden, Wilkinson, Scott & Richmond.

attys

J. G. ROBINSON.

CAR COUPLING.

APPLICATION FILED FEB. 16, 1910.

985,450.

Patented Feb. 28, 1911.

4 SHEETS—SHEET 3.

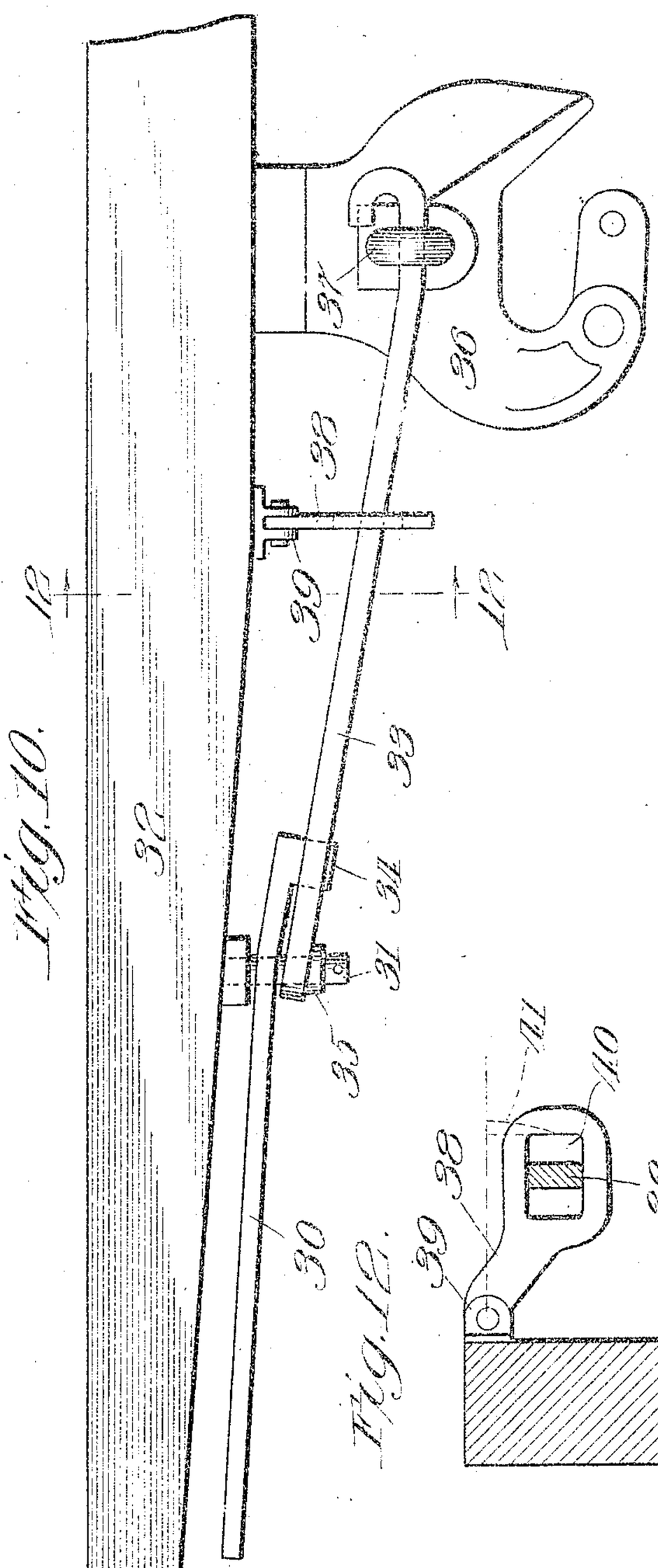


Fig. 10.

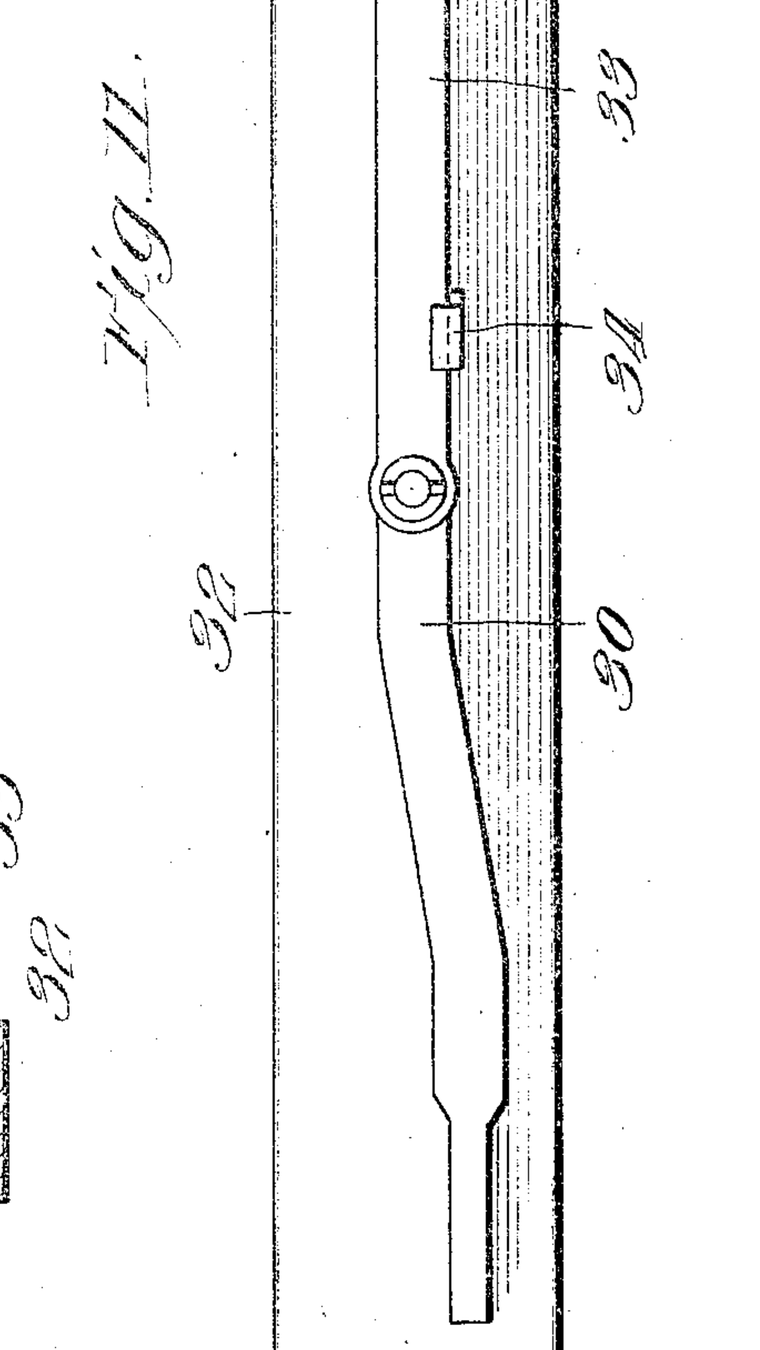


Fig. 11.

Fig. 12.

Witnesses:

Abey S. Luther

Henry A. Parks

Inventor:

Jay G. Robinson

by Hunton, Williams, Anderson, Moore & Richmond Attys

J. G. ROBINSON.

CAR COUPLING.

APPLICA ION FILED FEB. 16, 1910.

985,450.

Patented Feb. 28, 1911.

4 SHEETS—SHEET 4.

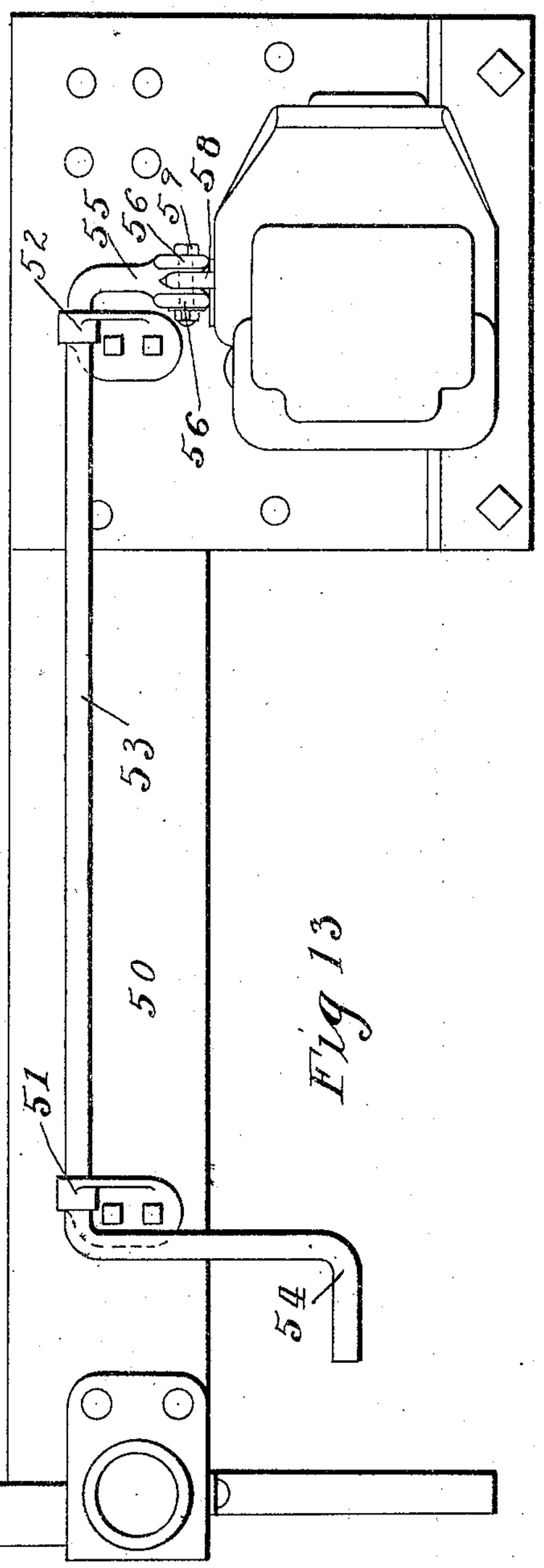


Fig 13

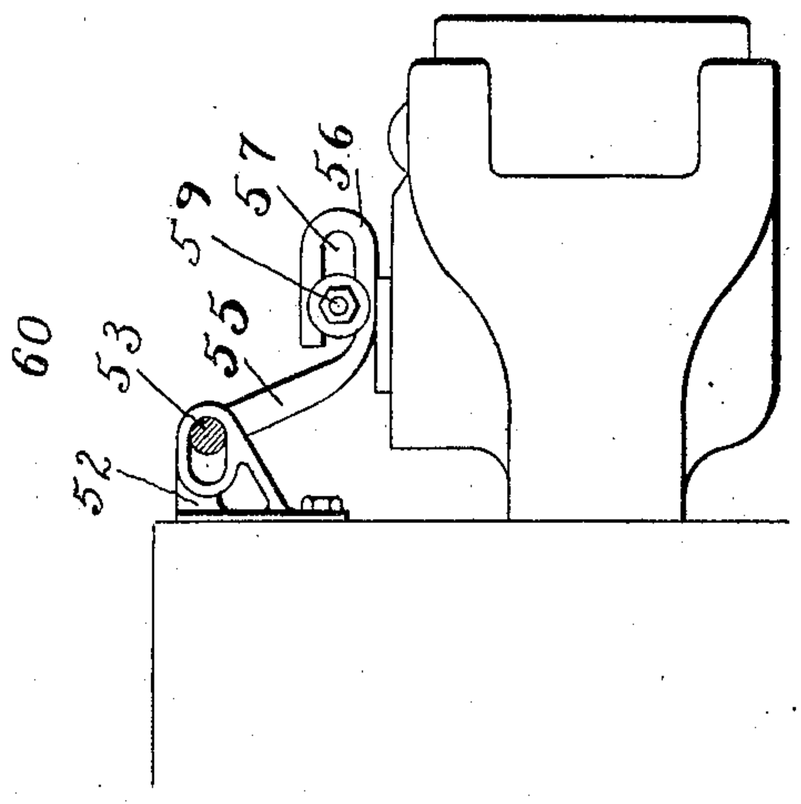


Fig 14

Witnesses:
C. C. Dunlap
Henry A. Parks

Inventor:
Guy G. Robinson
by Sheridan, Wilkinson, Scott & Richmond
Attys

UNITED STATES PATENT OFFICE.

JAY G. ROBINSON, OF CHICAGO, ILLINOIS.

CAR-COUPLING.

985,450. Specification of Letters Patent. Patented Feb. 28, 1911.

Application filed February 16, 1910. Serial No. 544,290.

To all whom it may concern:

Be it known that I, JAY G. ROBINSON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Car-Couplers, of which the following is a specification.

A frequent source of danger in railroad operation arises from the separation of the couplers from the draft rigging and the liability of the couplers after such separation to fall upon the track and cause the derailment of one section of the train. Such separation may occur in a variety of ways. The rivets connecting the coupler shank to the yoke may be sheared, thus causing a sudden separation. The yoke itself may gradually give way or the coupler head may be broken from the shank. If the coupler shank is broken from the draft rigging yoke, by reason of the shearing of the rivets or from other causes, the coupling will be pulled out until the strap shoulder or yoke buffing lugs, if there be any upon the shank thereof, strikes the carry-iron or end sill. Continued strain upon the coupling will cause it to carry away the carry-iron or to pull through the end sill, as the case may be, after which the detached coupling will separate from the coacting coupling on the next car and will fall upon the track, thus frequently causing derailment of the parted rear section of the train. Or, if the coupler head breaks from the shank, it will be pulled out and fall to the track in the same manner, but without restraint from the carry-iron or end sill.

It is one of the objects of my invention to provide means for drawing out the locking pin whenever a coupler head is torn from the remainder of the draft rigging and prior to its complete separation from the car, thus preventing the coupling from falling upon the track and leaving it supported in the carry-iron or in the opening in the end sill through which it passes, or upon the operating mechanism to which it is connected.

It is well understood to those familiar with the art that the locking pin of modern automatic couplers and the coacting parts of the couplers are so constructed that the locking pins may be withdrawn in some instances by a horizontal pull toward the car, and in others by a diagonally upward pull toward the car, as well as by a vertically upward pull. In couplers of the types most used the knuckle is held locked by the locking pin when the latter is in its lowermost position. When the locking pin is lifted to an intermediate or "lock-set" position the knuckle is released and free to open and if a disconnected coupler is adjusted to lock-set position the locking pin will fall to locking position when a second coupler is moved into engagement therewith. By lifting the locking pin above lock-set position in couplers of the forms commonly in use the knuckle will be turned on its pivot to open position ready to be joined to the coacting coupler of another car.

My invention is applicable to couplers of the general form above disclosed, among such being those known to the trade as the Sharon, and Latrobe, the Climax, the Simplex, and many others differing in certain details, but all conforming to the Master Car Builders' requirements. The Climax coupler is illustrated in Letters Patent Nos. 728,049 and 728,122, granted to Clinton A. Tower May 12, 1903, and the *Master Car Builders' Dictionary* contains illustrations of many others. Specific description of the coupler mechanism *per se* will therefore be unnecessary in this application, the details of construction being familiar to those conversant with the car building art.

An important feature of my invention resides in the fact that the same mechanism which is used for hand uncoupling serves with very slight modification to effect the automatic uncoupling above referred to, thus avoiding a duplication of mechanism and accomplishing both results with the minimum number of parts.

Further advantages of my invention and the precise nature thereof will appear from the following description and claims, taken in connection with the accompanying drawings, in which—

Figure 1 is a plan view of part of the end sill of a car and the coupler with my improvement applied thereto; Fig. 2, an elevation of the parts shown in Fig. 1; Fig. 2^a a fragmentary sectional view on the line 2^a, 2^a of Fig. 2; Figs. 3, 4, 5 and 6, detail views in section, showing the uncoupling shaft and lever in different positions and under different circumstances; Fig. 7, a fragmentary longitudinal section at the center of the car, showing the coupler and draft rigging; Figs. 8 and 9, diagrammatic views illustrating the action of the device, as will be explained

below; Fig. 10, a plan view similar to Fig. 1, showing my invention applied to another form of hand uncoupling device; Fig. 11, a view in elevation of the parts shown in Fig. 10; Fig. 12, a section on the line 12, 12 of Fig. 10; Fig. 13, a fragmentary elevation of part of the end of a car, showing a modification embodying the broad principle of my invention, as above explained; and Fig. 14, an end elevation of the structure shown in Fig. 13, the uncoupling shaft being in section between the brackets.

Referring to the structure shown in Figs. 1 to 7, inclusive, an uncoupling shaft 1 is pivoted in brackets 2 and 3 secured to the end sill 4. At its outer end the uncoupling shaft 1 is provided with an offset or crank 5, which terminates in a part 6 extending substantially parallel to the main body of the shaft 1. The part 6 forms a handle whereby the shaft 1 may be turned by the application of either hand or foot power, the handle being close to the side of the car.

The inner end of the shaft 1 adjacent the coupler is provided with an offset or crank arm 7 constructed at its outer end, in the present instance, in the form of a hook 17, this hook comprising the part 8 bent outwardly at substantially a right-angle to the part 7 and a part 9 bent back parallel to the part 8 and spaced therefrom sufficiently to form a loop or slot between the parts 8 and 9 to receive the uncoupling lever 10.

It will be obvious that the loop or slot formed by the bent part 8—9 on the outer end of the crank 7 might be otherwise constructed, and that the precise form illustrated need not necessarily be followed. While in the claims I refer to this part of the structure as a loop, it will be understood that the principal functions of this part are performed by the portion 8 thereof, which lies beneath the lever 10, and by the bent portion between the parts 8 and 9. Through the part 8 the lever 10 is lifted in the manual operation of the device, and in the emergency action the lever 10 contacts with the bent portion between the parts 8 and 9, and thereby gives rise to the automatic uncoupling action hereinafter explained. The upper portion 9, illustrated in the drawings, is useful in serving to retain the parts in assembled position.

The coupler head 11 is provided with the usual knuckle 12 pivoted thereto at 13'. As usual in couplers now in use the knuckle 12 is held in locked position by means of a locking pin 13 provided at its upper end with an eye. The uncoupling lever 10 is fulcrumed in a bracket 14, which is secured to and projects from the end sill 4. The bracket 14 is provided with a non-circular, preferably rectangular opening 15 through which the uncoupling lever 10 passes. The end of the uncoupling lever where it engages the bracket 14 is preferably flattened or otherwise shaped to conform to the opening in the bracket 14 and to be non-rotatable therein on the longitudinal axis of said lever. The opposite end of the uncoupling lever 10 is shaped to form a hook 16, which engages the eyelet in the upper end of the locking pin 13. The uncoupling lever 10 engages the opening 15 in the bracket 14 with sufficient freedom to permit it to slide endwise therein for the purpose of permitting it to follow the side swing of the coupler head upon curves, and also permitting the lever 10 to move in vertical and horizontal planes upon the bracket 14 as a fulcrum. Rotation of the lever 10 upon its longitudinal axis, however, is prevented by the engagement of its non-circular outer end with the non-circular opening 15 in the bracket 14.

In Figs. 1 and 3 the parts are illustrated in their normal position, the crank arm 7 lying flat against the end sill 4. In this position the crank arm 5 and handle 6 also lie parallel to the end sill, and the hook 17 occupies its lowermost position. In this position also the uncoupling lever 10 lies upon the arm 8 of the hook 17 intermediate its ends in a position where it may move either outwardly or inwardly without imparting movement to the hook 17 and its shaft 1. It will be apparent that if the handle 6 be drawn outwardly from the end of the car the parts will move from the position illustrated in Fig. 3 through that illustrated in Fig. 4 to that illustrated in Fig. 5, thus raising the uncoupling lever 10 upon its bracket 14 as a fulcrum. The outer hooked end 16 of the lever 10 being more remote from the fulcrum bracket 14 than the hook 17 where the power is applied, will move through a correspondingly greater distance and will elevate the locking pin. Fig. 4 is intended to represent the position of the parts when the locking pin is raised to lock-set position, and Fig. 5 represents the position of the parts when the locking pin has been raised sufficiently to throw the knuckle to open position. It will be noted that in lifting the pin from locking position, shown in Fig. 3, to lock-set position, shown in Fig. 4, the lever 10 is forced toward the car body by the movement and inclination of the lower arm 8 of the hook 17, thus imposing a diagonally upward pull toward the car body on the locking pin. In some forms of coupler, for instance the Latrobe, it is desirable that in lifting the locking pin by hand operation to lock-set position the upper end of the pin be at the same time given a horizontal pull toward the car body for the purpose of throwing the lower end of the pin away from the car body to cause its toe to catch in lock-set position. This movement of the locking pin is accomplished by mechanism as above described

and illustrated in Figs. 3 and 4. By reference to Figs. 3 and 4 it will also be noted that as the operation progresses the lever 10 moves toward the car body, thus shortening the load arm and increasing the advantage with which power is applied at the beginning of the operation of lifting the lock pin by hand operation. The handle 6 is located at the side of the car where it may conveniently be grasped by an operator standing upon the ground, and an operator standing upon the step of the car may place his foot against the handle 6 and push it outwardly from the car. Convenient means are thus provided for raising the locking pin. Inasmuch as the handle 6 occupies its lowermost position when the coupler is locked there can be no danger of accidentally uncoupling by reason of a trainman stepping upon the handle 6 when boarding or alighting from a car.

As thus far described the mechanism shown in the drawing provides convenient and efficient means for manipulating the locking pin of the coupler, and I will now proceed with a description of the action of the device in automatically raising the locking pin when the coupler is torn from a car.

The draft gear of a railway car permits from an inch and three-quarters to three and one-quarter inches movement of the coupler toward and from the car upon compression of the draft rigging due to pulling and buffing stresses. In Fig. 3 the uncoupling lever 10 is represented in full lines in its normal position, that is when there is neither a pulling nor buffing strain imposed upon the draft rigging. In this position the uncoupling lever 10 lies sufficiently inside of the bend of the hook 17 to permit the coupler to be drawn out under a pulling strain to the extent of the normal movement of the draft rigging before causing said lever 10 to contact with the bend of the hook 17. There is also sufficient clearance to permit the coupler head to move inwardly under a buffing strain without causing the uncoupling lever 10 to contact with the coacting parts.

In the event of the coupler being torn from the car its abnormal movement will draw the uncoupling lever 10 against the bend of the hook 17 as illustrated by the dotted circle 10′ in Fig. 3. Continued outward pull upon the coupler head will be communicated to the inner end of the uncoupling lever 10 through its connection with the eye in the locking pin 13, thus causing said lever to bear outwardly against the hook 17 in the direction of the lower arrow shown in Fig. 6. The outward movement of the lever 10 upon its bracket 14 as a fulcrum will cause the hook 17 to turn upon its shaft 1 as a center from the position shown in Fig. 3 to that shown in Fig. 6, the pivotal movement of the shaft 1 which carries the hook 17 permitting it to move through an arcuate path, as indicated by the line 18. The hooked end 16 of the uncoupling lever 10 being farther removed from the fulcrum bracket 14 will move through an arc of correspondingly greater radius. The effect of the abnormal outward movement of the coupler head therefore is to impose upon the locking pin an upward pull and at the same time to cause the point of connection between the uncoupling lever and locking pin to move outwardly from the car body.

When a train is moving forward due to the locomotive pull the locking pins of the couplers will be tightly gripped between the walls of the drawbars and tails of the knuckles, but when from any cause a coupler parts from a car the locking pin will be released from the gripping action. If the rivets securing the coupler to the yoke are sheared off or if the yoke breaks, the locking pin will be released at the moment of fracture but will be again temporarily gripped when the shoulders 29 (Fig. 7) or yoke buffing lugs, if there be any, contact with the carry-iron or inner face of the end sill. Before such contact takes place, however, the coupler moves through a distance of from two to nine and one-quarter inches, thus affording ample time for withdrawal of the locking pin before it is again gripped by the locomotive pull due to the shoulders 29 or yoke buffing lugs contacting the end sill or carry-iron. In case the coupler head breaks away from its shank, the locking pin is permanently released.

It will be apparent that when the coupling is torn away from a car, if the upper end of the locking pin were to be held stationary relative to the car body, the pin would bind against the coacting walls of the opening in the coupler head, the upper end binding against the wall toward the car and the lower end binding against the opposite wall. In devices as heretofore constructed, attempts have been made to overcome this binding action which, of course, interferes with the withdrawal of the pin, by providing a locking pin with pivotal joints and rounding the upper end of the opening in which it is received toward the car body. For the same purpose the opening is made of such a size as to afford more or less clearance for the locking pin. By this expedient the removal of the pin is somewhat facilitated, the bending of the pin upon its pivotal joints, and the clearance in the opening in the coupler head to some extent preventing the pin from binding even when the coupler is pulled away from the car while the head of the pin is held stationary relative to the car body. In

case a chain connection from the locking pin to the end sill is used its efficiency depends upon its being of precisely the right length. The mechanism above described, however, provides effectual means for preventing the binding action referred to, and provides adjustment for coincident action. It will be noted that as the coupler head moves an abnormal distance from the car body, that is, a distance greater than that permitted by the normal action of the draft rigging, not only is an upward pull imposed upon the locking pin by reason of the turning of the hook 17 upon its shaft 1 as a center, but the uncoupling lever also moves away from the car body, such movement being represented in the case above described by the line 19, 20, (Fig. 6) which is the horizontal component of the arcuate movement represented by the arc 18. The amount of upward movement communicated to the locking pin is represented as shown in Fig. 6 by the line 19, 21, this being the vertical component of the arcuate movement represented by the arc 18. The effect of this operation is to impose an upward pull upon the locking pin and at the same time to permit the point of connection between the locking pin and uncoupling lever to move away from the car body with the coupler head, thus, according to the proportion of the parts, preventing to the extent desired a backward horizontal pull upon the upper end of the locking pin. This results in action the same as a vertical raising of the lock pin of a coupler at rest. The elimination of the backward pull upon the upper end of the locking pin prevents the pin from binding and thereby obviates any possibility of a failure to automatically unlock the coupling when the coupler is torn from its connection with the car.

In some forms of coupler, notably that known to the trade as the Sharon coupler, the locking pin can be withdrawn by a horizontal pull toward the car body. In other forms of coupler, for instance that known as the Latrobe coupler, a slight backward pull upon the upper end of the locking pin is desirable in hand operation for the purpose of throwing the toe upon the locking pin forward for the purpose of catching the same in lock-set position. In other forms of coupler, namely, those in which an absolutely rigid locking pin is employed as, for instance, the "Simplex", a horizontal pull upon the upper end of the locking pin will not withdraw the same on account of causing the locking pin to bind in its seat in the coupler.

By changing the proportion of the parts of mechanism as above described the direction of pull upon the locking pin may be adjusted to any angle desired, and I have found that an adjustment may be secured which will be operative with practically all forms of coupler now in common use. It will be apparent that by lengthening the brackets 2 and 3 shown in Fig. 1, thus carrying the pivotal center of the shaft 1 farther from the end sill and nearer a vertical line over the uncoupling lever 10, the uncoupling lever 10 while moving under the locomotive pull when the coupler tears away from the car will move outwardly from the car body a greater distance while it is being lifted. The same result can be accomplished by lengthening the crank arm 7, thus locating the pivotal center of the shaft 1 at a point farther above the uncoupling lever 10. By varying the proportion and disposition of the parts as above suggested it will be apparent that within practical limits any desired outward movement may be given to the point of connection between the uncoupling lever and locking pin while the locking pin is being raised as a result of the locomotive pull upon the coupler head after the coupler has moved beyond its normal limit of movement.

In Figs. 8 and 9 I have represented the coupler head diagrammatically by the rectangle 23. Referring to Fig. 8, the outward horizontal component of the arcuate movement of the point of connection between the uncoupling lever and locking pin is represented by the length of the arrow 24. The length of the arrow 25 represents the abnormal movement of the coupler head during the interval when the locking pin is being lifted. Under these circumstances the resultant pull upon the locking pin would be vertically upward relative to the coupler head as represented by the arrow 26. If on the other hand, as represented in Fig. 9, the horizontal component of the arcuate movement of the point of connection between the uncoupling lever and locking pin represented by the arrow 27 is less than the outward movement of the coupler head which takes place while the locking pin is being released, the resultant pull upon the locking pin relative to the coupler head, will be in a line inclining upward and toward the car body, as represented by the arrow 28.

A further advantage in the use of my improved mechanism arises from the fact that if the hook 17, or equivalent part embracing the uncoupling lever 10 be initially formed, through careless workmanship, or from other causes, in such manner as to allow insufficient play to accommodate the normal outward movement of the coupler head, the strain thereby imposed upon the hook 17 or equivalent part will merely tend to distort such parts to an extent sufficient to accommodate the normal outward movement of the coupler head. These parts ordinarily being made of steel of a character that will bend without breaking, no injurious result will follow in

case sufficient play is not allowed for the uncoupling lever 10 under normal conditions. Accidental uncoupling when the uncoupling lever 10 is forced against the outer bend of the hook 17 or equivalent part during a normal outward movement of the coupler head is impossible for the reason that during such outward pull upon the coupler head the locking pin is gripped in the coupler head by the locomotive pull which is transmitted to the knuckle, thus gripping the locking pin with a force so great as to render lifting of the locking pin to release position absolutely impossible under any upward pull that is transmitted thereto through the tendency of the hook 17 or equivalent part to turn upon the shaft 1 as a center.

Another advantage of my improved mechanism lies in the fact that no difficulty could arise from initially constructing the hook 17 or other equivalent part embracing the uncoupling lever 10 in such manner as to allow too much movement of said lever before contacting with the bend of said hook 17 or equivalent part. When the shank of a coupler breaks it is, of course, relieved from the locomotive pull as the coupler head is absolutely free from the car to which it was attached and therefore the locking pin cannot be gripped under the force of the locomotive pull after the shank is once broken. Under these circumstances therefore the pin would be lifted as soon as the uncoupling lever came into contact with the bend of the hook 17 or equivalent part. In case the yoke breaks or the rivets securing the yoke to the coupler shear the coupler will be relieved from the locomotive pull until the shoulders on the coupler represented by the numeral 29 in Fig. 7 of the drawing contact with the inner face of the end sill or with the carry-iron. The amount of movement which takes place before these shoulders contact with the end sill or carry-iron, thus again temporarily imposing the force of the locomotive pull upon the coupler head, is generally in the neighborhood of two to nine and one-quarter inches. This leaves sufficient margin for any error likely to occur.

In Figs. 10, 11 and 12 I have illustrated the application of my invention to another form of hand uncoupling device. This device as ordinarily constructed comprises a lever 30 fulcrumed upon a pin 31 and extending outwardly to a point adjacent the side of the car, and being provided at its inner end with a projection 34 which extends beneath an uncoupling lever 33 also pivoted upon the pin 31. The pin 31 is provided near its outer end with a shoulder 35 spaced sufficiently from the inner end of said pin to allow the lever 33 to swing outwardly and inwardly in a horizontal plane to accommodate the normal movement of the coupler head 36. The uncoupling lever 33 at its inner end passes through an eye in the locking pin 37. It will be apparent that downward pressure upon the outer end of the lever 30 will have the effect of raising the uncoupling lever 33, thus imposing an upward pull upon the locking pin 37.

As so far described this device is old and in use. In order to apply my invention to this mechanism I pivot a link 38 in a bracket 39 secured to and projecting outwardly from the end sill. The form of the link 38 is clearly shown in Fig. 12. The link, in normal position of the coupler head, that is when no strain is imposed thereon, slopes outwardly and downwardly from the end sill. In its outer end the link 38 is provided with an opening 40 through which the lever 33 passes with sufficient clearness on each side to allow for the normal movements of the coupler head upon pulling and buffing stresses without carrying said lever 33 into contact with the ends of the slot 40 in the link 38. Upon an abnormal outward movement of the coupler head beyond the limits allowed by the draft rigging and due to the coupler being torn from the car it will be apparent that the uncoupling lever 33 will contact with the outer end of the slot 40 in the link 38. A continuation of the outward movement of the lever 33 after it has contacted with the end of the slot 40 will cause the link 38 to move upon its pivotal connection with the bracket 39 as a center in the path indicated by the arc 41. This movement is similar to that above described in connection with the structure shown in Figs. 1 to 7 and accomplishes the same results. It will be apparent that an abnormal outward movement of the coupler head in the structures illustrated in Figs. 10, 11 and 12 will impose an upward pull upon the locking pin and then by varying the proportion and disposition of the link 38 the point of connection between the lever 33 and locking pin 37 may be permitted to move outwardly from the car body to any extent practicably desirable during the lifting of the locking pin due to the turning of the link 38 upon its pivotal center.

In Figs. 13 and 14, I have illustrated the broad principle of my invention applied in connection with an uncoupling device of a form different from those above described. Upon the end sill 50 in the brackets 51 and 52 I mount an uncoupling shaft 53 provided at its outer end with a crank handle 54. Upon its inner end the shaft 53 is provided with a crank arm 55 bifurcated at its lower end forming branches 56 constructed in the form of hooks or loops having slots 57. Through the eye of the upper end of the locking pin 58 I insert a bolt 59, and after the nut is threaded upon the bolt the

end of the bolt is preferably riveted over to prevent the nut from coming off. The projecting ends of the bolt 59 extend through the loops 57 in the branches 56 of the crank 55, and in normal position of the parts, the bolt 59 has sufficient play outwardly from the car to accommodate the normal movement of the draft rigging.

The bracket 51 may be of the form above described in connection with Figs. 1 to 7, having a circular aperture the walls of which rotatably engage the shaft 53. The inner bracket 52, however, instead of having a circular aperture, is shown as provided with a slot 60 in which the shaft 53 has a certain amount of play toward and from the car body. The bolt 59 is shown as having a certain amount of play toward the car body in the loops or slots 57.

In hand operation, an outward pull upon the crank handle 54 will throw the inner end of the shaft 53 toward the car body, such movement being permitted by the elongated form of the aperture 60 in the bracket 52, and the rotation of the shaft 53 upon its axis will lift the locking pin and at the same time, during the first part of the lifting operation, move the upper end thereof toward the car body, as explained in connection with the structures shown in Figs. 1 to 6, thus throwing the lower end of the locking pin forward to insure its catching in lock-set position. The slot 60 in the bracket 52 also serves when an engine is moved against the train for the purpose of taking out the slack to permit the coupler to move inward toward the car body, this inward movement being permitted partially by the movement of the bolt 59 in the slots 57 and partially by the movement of the shaft 53 in the slot 60. The slot 60 thus serves a two-fold function, facilitating the manual setting of the coupling to lock-set position, and assisting in permitting the requisite movement in taking the slack out of the couplers and draft rigging, the latter operation being ordinarily performed by an engineer preparatory to starting a long train.

It will be obvious that upon excessive outward movement of the coupler due to its tearing away from the car, the bolt 59 will contact with the outer bend in the loops or slots 57. The outward movement of the coupler after such contact has taken place will cause the crank arm 55 to rotate with its shaft 53, thus imparting an arcuate movement to the upper end of the locking pin, and not only lifting the pin but moving its point of connection with the crank 55 outwardly with the coupler, as explained above.

It will be observed that in all of the illustrated forms of my invention there is a member pivoted to the car body transversely thereof, that is, by means of a pivot extending transversely of the car and that the pivotal connection of said member with the car body is out of horizontal alinement with the connection of said member with the remainder of the mechanism.

From the foregoing it will be apparent that my invention is applicable to couplers of widely different types, and that it may also be applied in connection with various forms of hand uncoupling mechanism. Furthermore, while my invention is applicable to various forms of hand uncoupling devices and can be applied thereto by means of very slight changes in the mechanism employed, it will be obvious that the automatic uncoupling functions are accomplished independently of the extension of the mechanism extending to the side of the car for hand manipulation.

Mechanism for accomplishing the purposes described herein and involving the same principle of operation, but differing slightly in specific form, is shown in my copending application Serial No. 520,400, filed September 30, 1909.

What I claim is:

1. In a car, a resilient draft rigging, a coupler connected to said draft rigging and provided with a locking pin, uncoupling mechanism comprising a plurality of parts which form a connection between said locking-pin and the car body, said mechanism including a member pivoted to said car body and having its pivotal axis extending transversely of said car body out of horizontal alinement with the point of connection between said mechanism and said locking pin, said mechanism having a loose connection between its parts to permit the locking pin to move freely with the coupler to the extent permitted by the draft rigging, the lost motion of said loose connection being substantially equal to the maximum normal movement permitted by the draft rigging whereby an abnormal movement of the coupler imposes a strain upon said pivoted member imparting a pivotal movement thereto and causing said locking pin to move in the arc of a circle.

2. In a car, a resilient draft rigging, a coupler connected to said draft rigging and provided with a locking pin, uncoupling mechanism connecting said locking pin to the car body, said mechanism comprising a member pivoted to said car body, a rigid member connected directly to said pin and to said car body and having a sliding connection with the first named member whereby the said locking pin is permitted to move freely with the coupler head to the extent permitted by the draft rigging but is caused to move in the arc of a circle by an abnormal movement of the coupler head.

3. In a car, a resilient draft-rigging, a

coupler provided with a locking pin, an uncoupling device comprising a lever extending transversely of the car, said lever being fulcrumed near one end upon the car body and at the other end engaging said locking pin, a member pivoted on the car body transversely thereof and operatively connected to said lever intermediate its fulcrum and point of engagement with said locking pin, the pivotal connection of said element with said car body being out of horizontal alinement with the point of its connection with said lever, and the connections of said locking pin with said car body through said pivoted member and lever having sufficient lost motion to permit the locking pin to move with the coupler to the extent permitted by the draft rigging but causing an abnormal movement of said coupler and locking pin to impart a pivotal movement to said element, whereby said locking pin is moved in the arc of a circle.

4. In a car, a resilient draft-rigging, a coupler provided with a locking pin, an uncoupling device comprising a lever extending transversely of the car, said lever being fulcrumed near one end upon the car body and at the other end engaging said locking pin, a member having a pivotal connection with the car body and having an operative connection with said lever intermediate its fulcrum and point of engagement with said locking pin, the pivotal connection of said member with said car body being out of horizontal alinement with the point of its connection with said lever; and one of the connections of said member having sufficient lost motion to permit the locking pin to move with the coupler to the extent permitted by the draft rigging but causing an abnormal movement of said coupler and locking pin to impart a pivotal movement to said member, whereby said locking pin is moved in the arc of a circle.

5. In a car, a resilient draft rigging, a coupler comprising a locking pin, an uncoupling device comprising a lever extending transversely of the car, said lever being fulcrumed near one end upon the car body and at the other end engaging said locking pin, a shaft journaled upon the end of the car and extending in substantially the same direction as said lever from the side of the car to a point beyond the fulcrum of said lever, a crank arm upon the inner end of said shaft having a loop engaging said lever, said shaft and loop being out of horizontal alinement, said loop loosely engaging said lever to permit said lever and locking pin to move with said coupler to the extent permitted by said draft rigging but causing an abnormal outward movement of said coupler and locking pin to impart a rotary movement to said shaft, whereby said locking pin is moved in the arc of a circle.

6. In a car, a coupler comprising a locking pin, an uncoupling device comprising a lever extending transversely of the car, a bracket upon the end sill of the car, said bracket being provided with an aperture in which said lever is fulcrumed and is slidable endwise, a member pivoted on the car transversely thereof and having a loop engaging said lever, the pivot of said member being out of horizontal alinement with said loop, said loop loosely engaging said lever to permit said lever and locking pin to move with said coupler to the extent permitted by said draft rigging but causing an abnormal outward movement of said coupler and locking pin to impart a rotary movement to said member, whereby said locking pin is moved in the arc of a circle.

7. In a car, a coupler comprising a locking pin, an uncoupling device comprising a lever extending transversely of the car, a bracket upon the end sill of the car, said bracket being provided with an aperture in which said lever is fulcrumed and is slidable endwise, a shaft journaled upon the end sill and extending in substantially the same direction as said lever from the side of the car to a point beyond the fulcrum of said lever, a crank arm upon the inner end of said shaft having a loop engaging said lever, said shaft and loop being out of horizontal alinement, said loop loosely engaging said lever to permit said lever and locking pin to move with said coupler to the extent permitted by said draft rigging but causing an abnormal outward movement of said coupler and locking pin to impart a rotary movement to said shaft, whereby said locking pin is moved in the arc of a circle.

In testimony whereof, I have subscribed my name.

JAY G. ROBINSON.

Witnesses:
EDYTHE M. ANDERSON,
HENRY A. PARKS.