No. 813,107. PATENTED FEB. 20, 1906.

W. McCONWAY, Jr.

CAR COUPLING.

APPLICATION FILED AUG. 8, 1905.

6 SHEETS—SHEET 1.

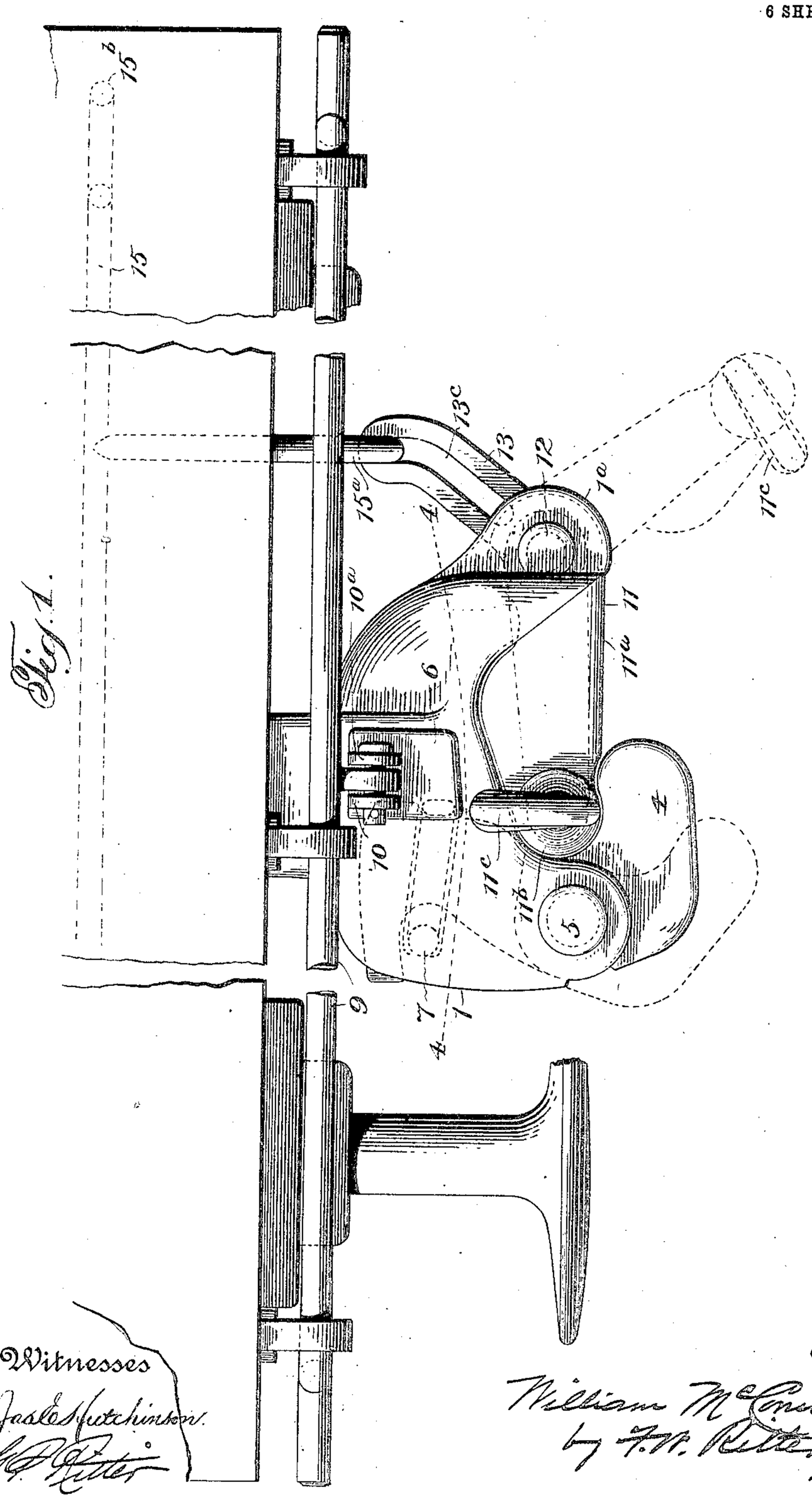

Fig. 1.

Witnesses

Jas. E. Hutchinson.

G. F. Ritter

Inventor

William McConway Jr.

by F. F. Ritter & Co.

Attorney

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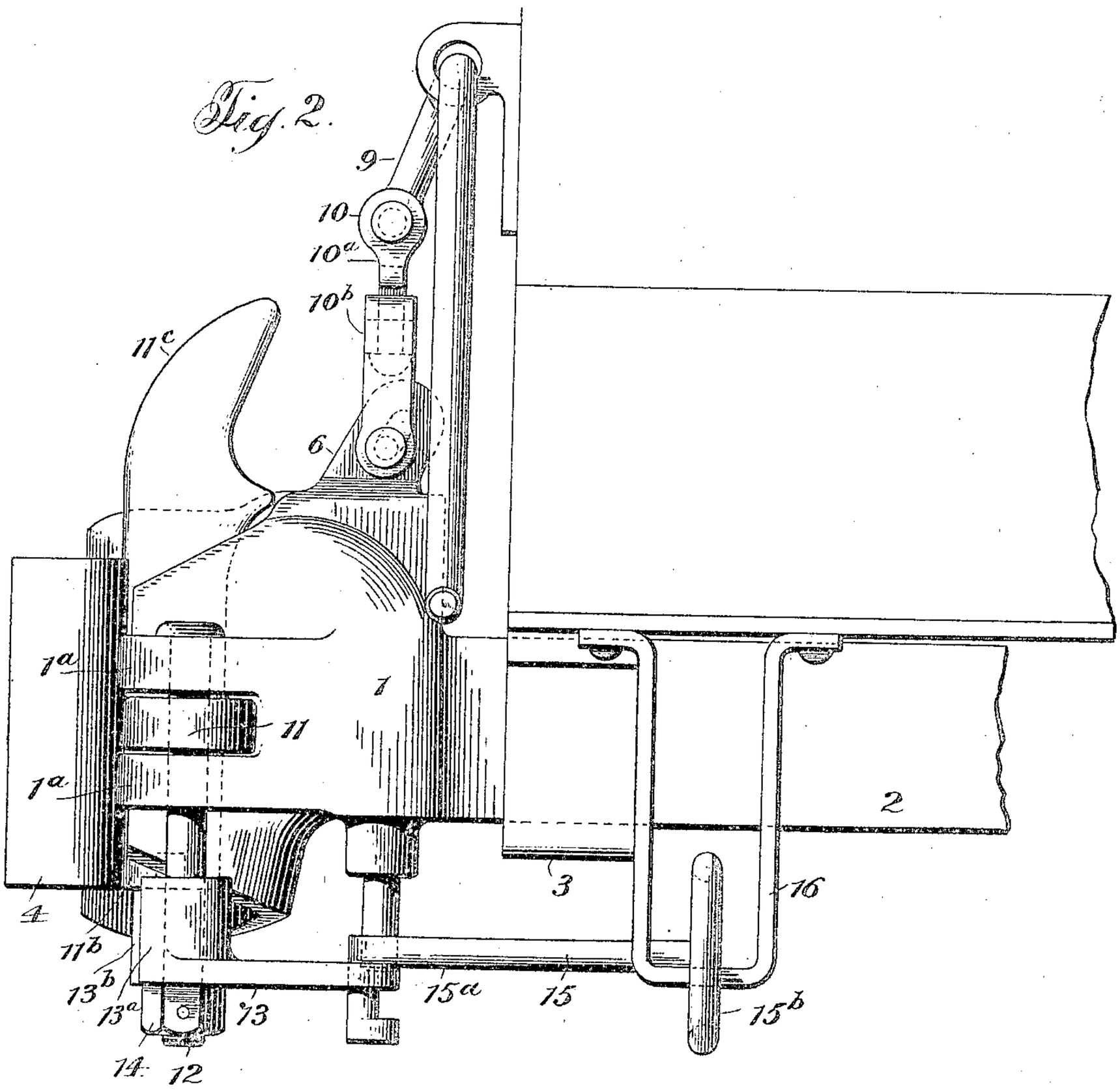
6 SHEETS—SHEET 2.

Fig. 2.



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Jas. E. Hutchinson.

[illegible] Ritter

Inventor

William McConway Jr.

by F. W. Ritter Jr.

Attorney

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6 SHEETS—SHEET 3.

Fig. 3.

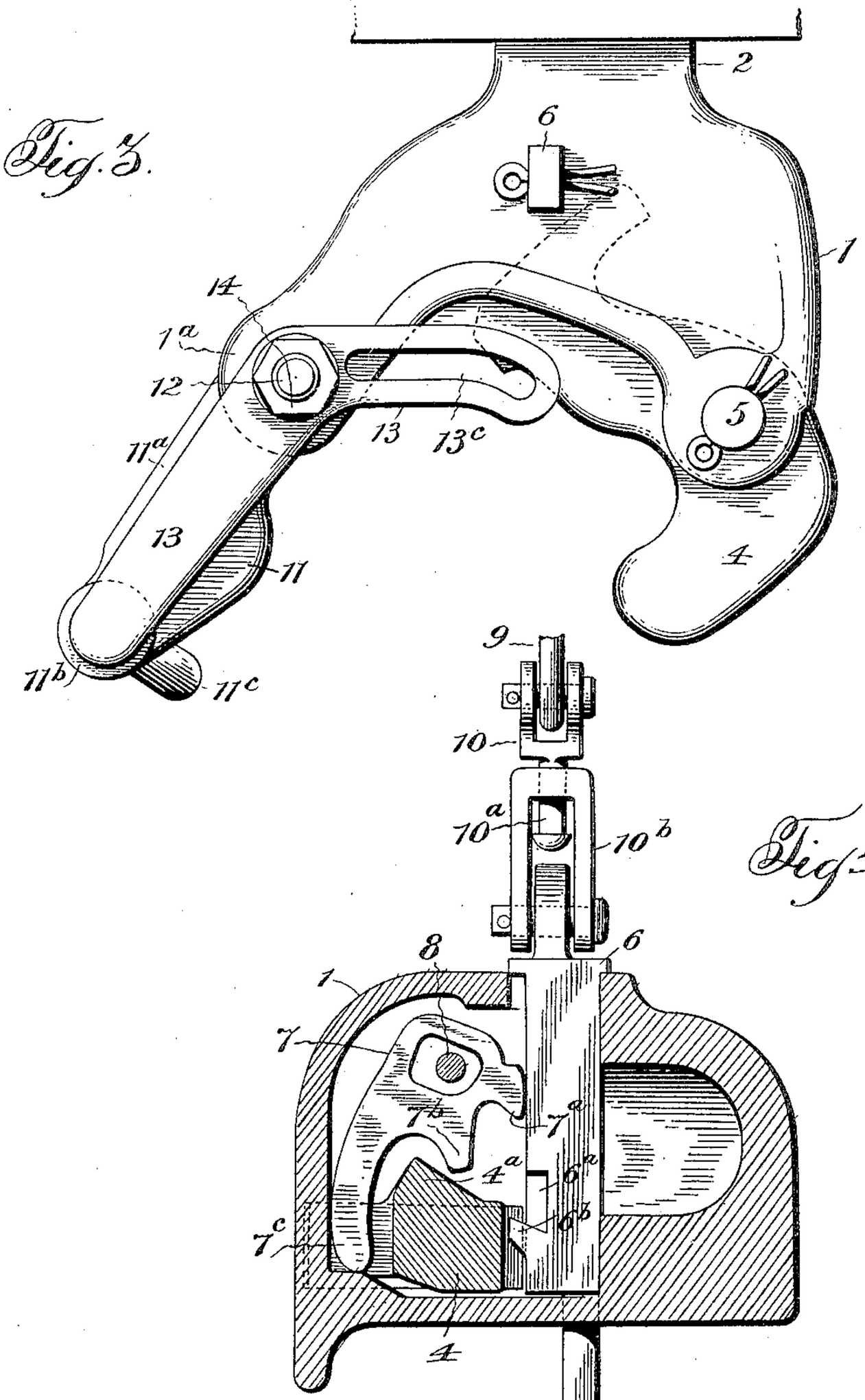

Fig. 4.

Witnesses

Jas. E. Hutchinson.

G. F. Ritter

Inventor

William McConway, Jr.

by F. F. Ritter Jr.

Attorney

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6 SHEETS—SHEET 4.

Fig. 5.

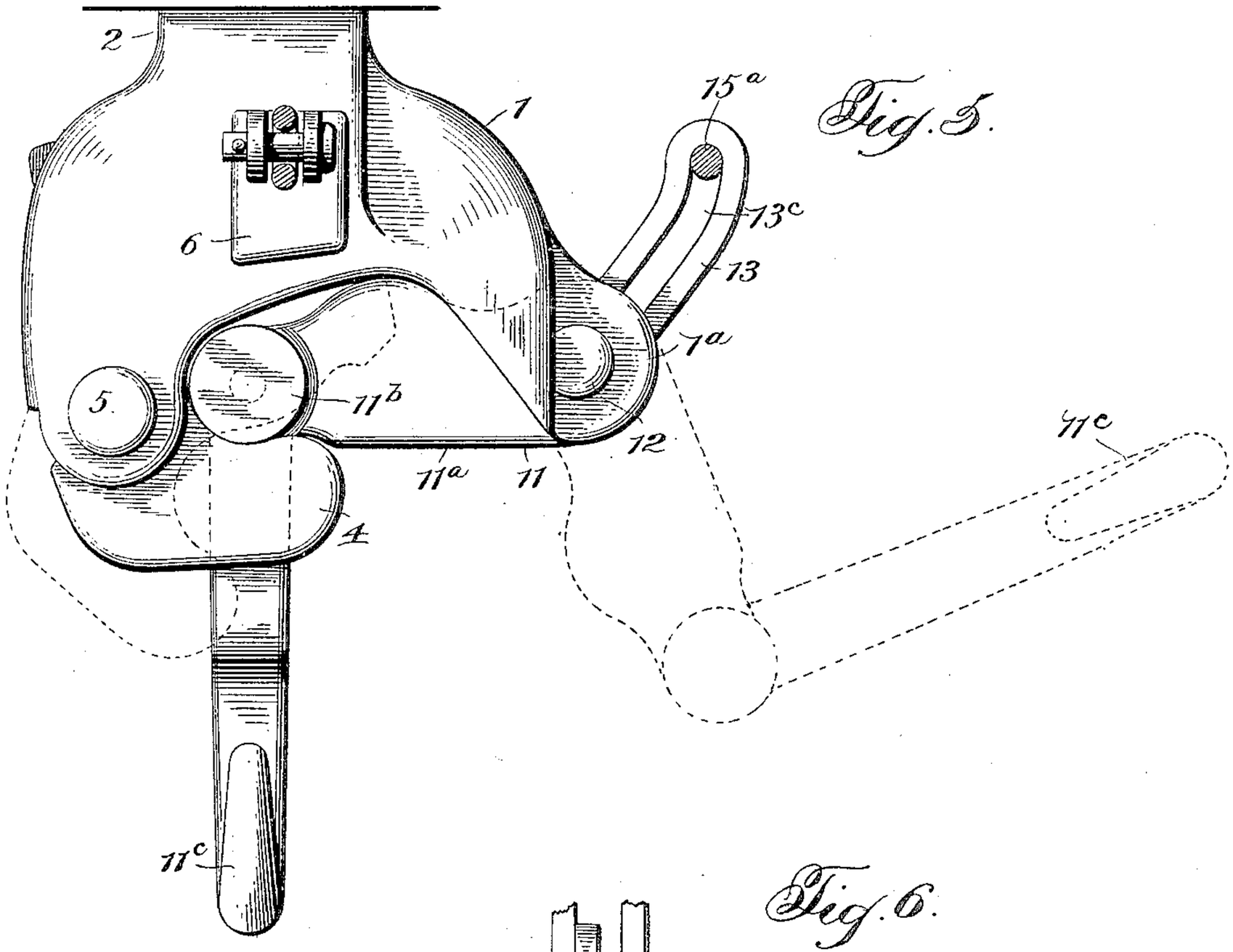
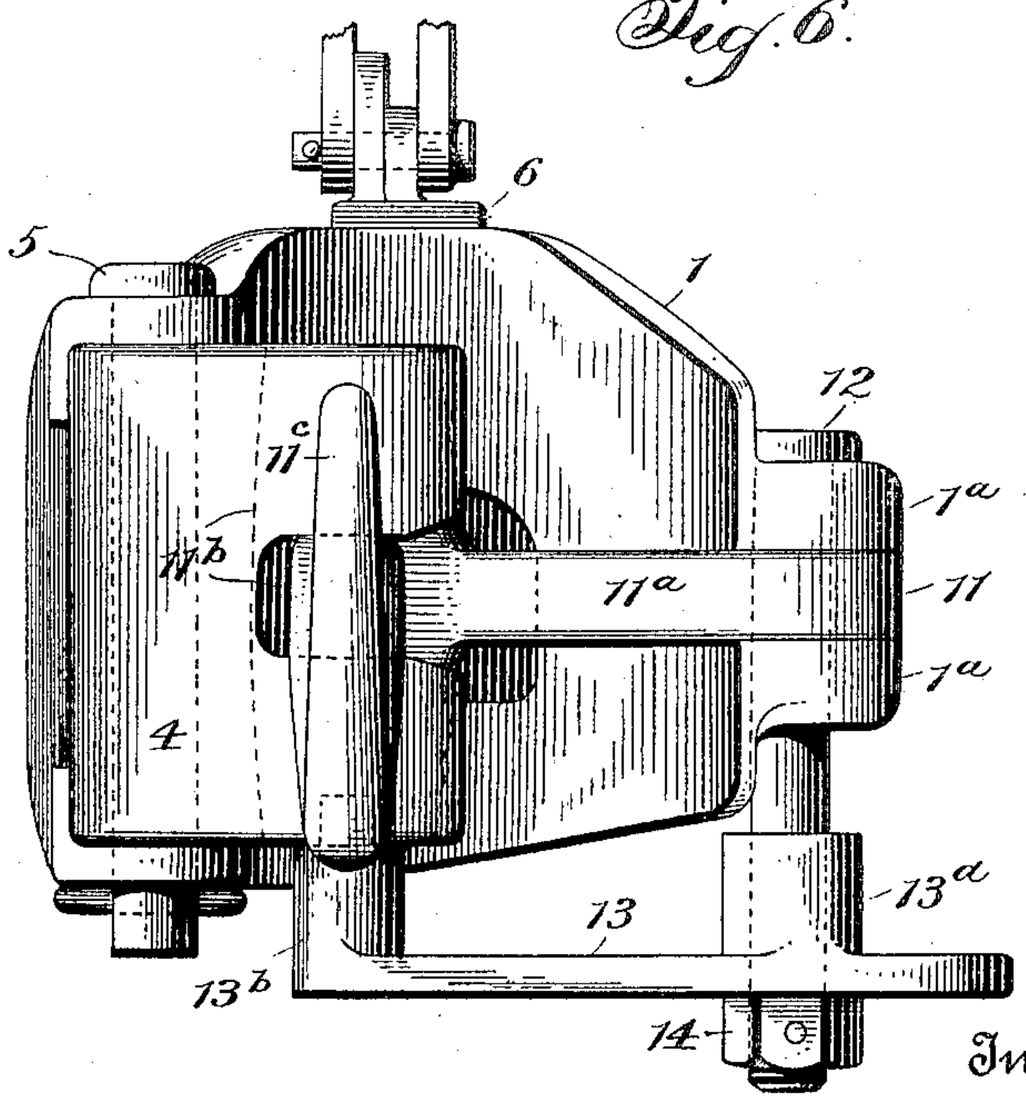


Fig. 6.



Witnesses

Jas. E. Hutchinson

G. P. Ritter

Inventor

William McConway Jr.

by F. P. Ritter, Jr.

Attorney

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6 SHEETS—SHEET 5.

Fig. 7.

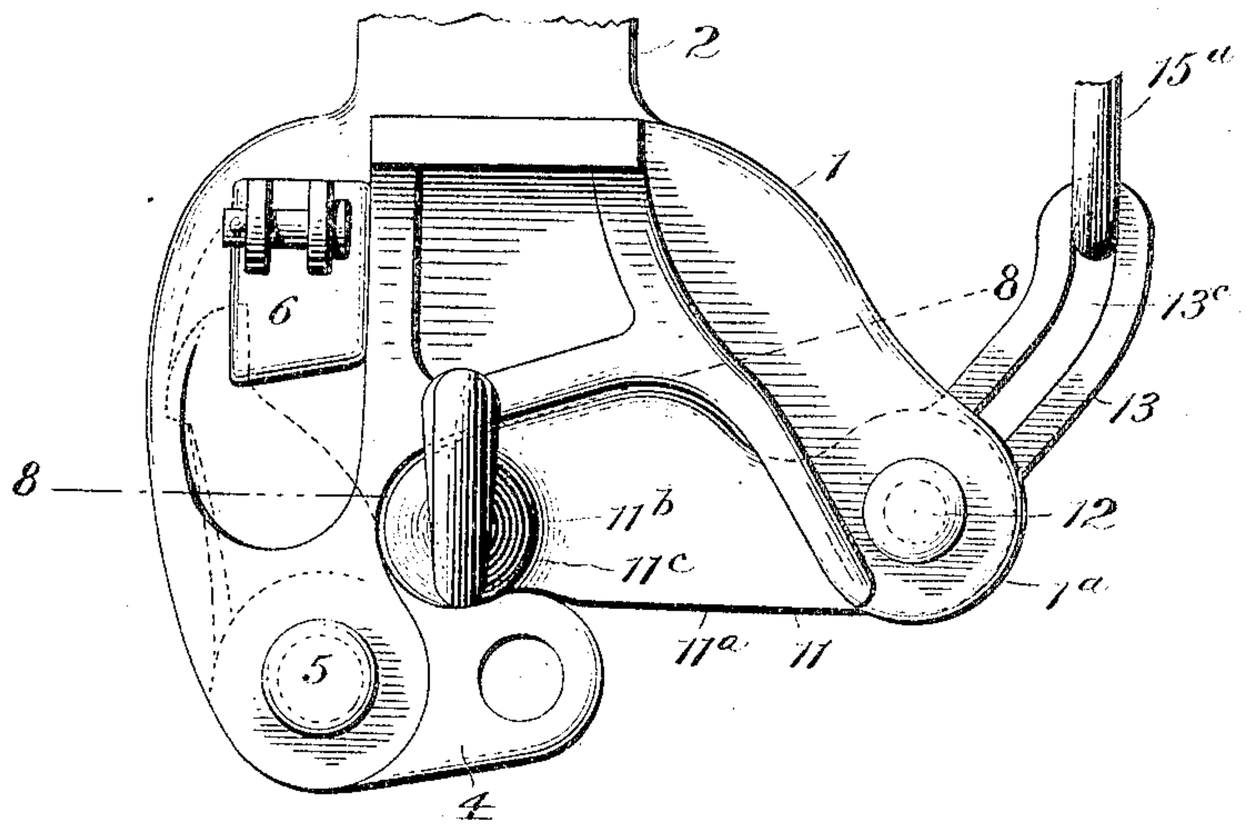
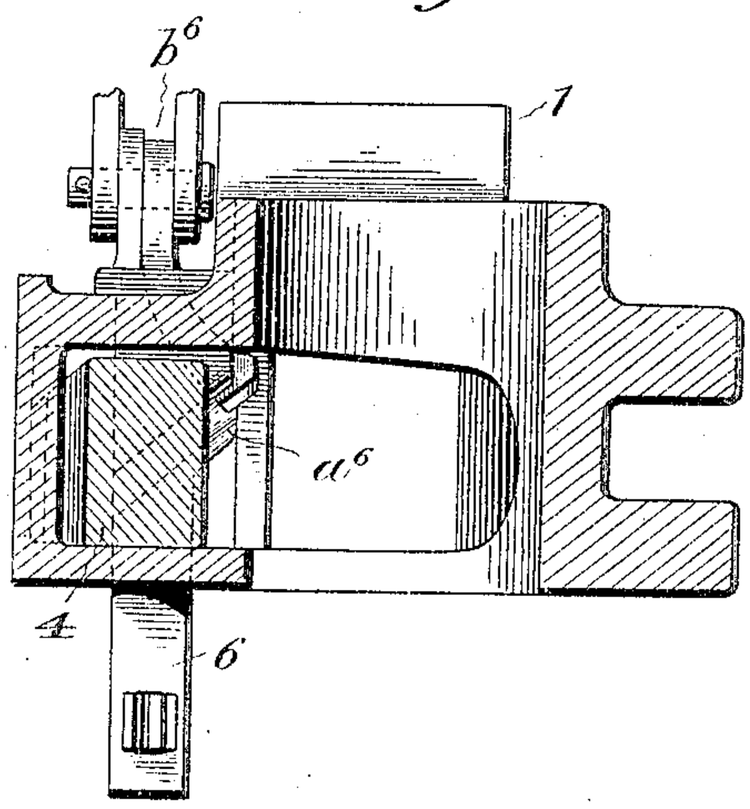


Fig. 8.



Witnesses

Jas. E. Hutchinson.

L. F. Ritter

Inventor

William McConway Jr.

by F. W. Ritter & Co.

Attorney

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W. McCONWAY, Jr.

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6 SHEETS—SHEET 6.

Fig. 9.

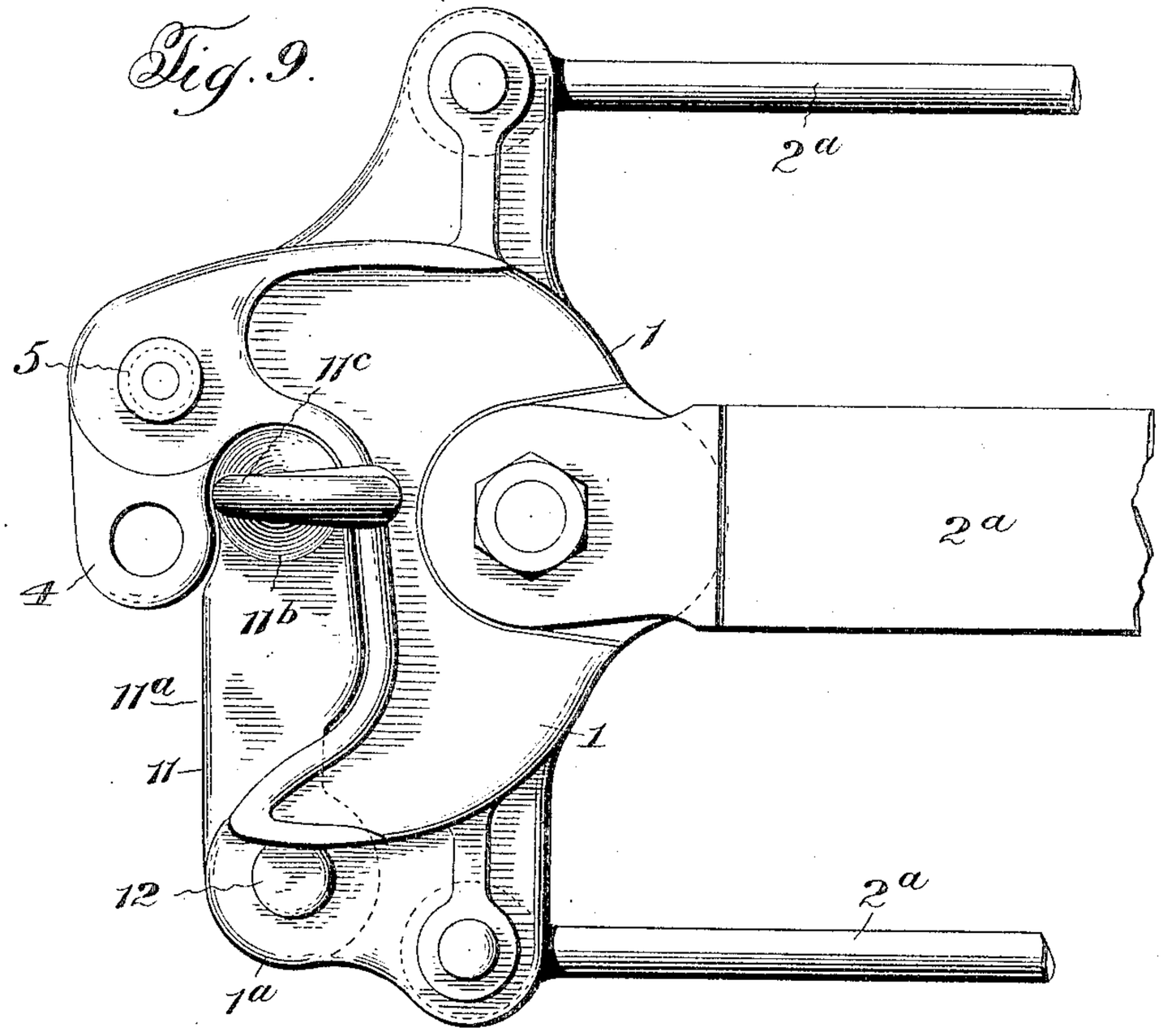
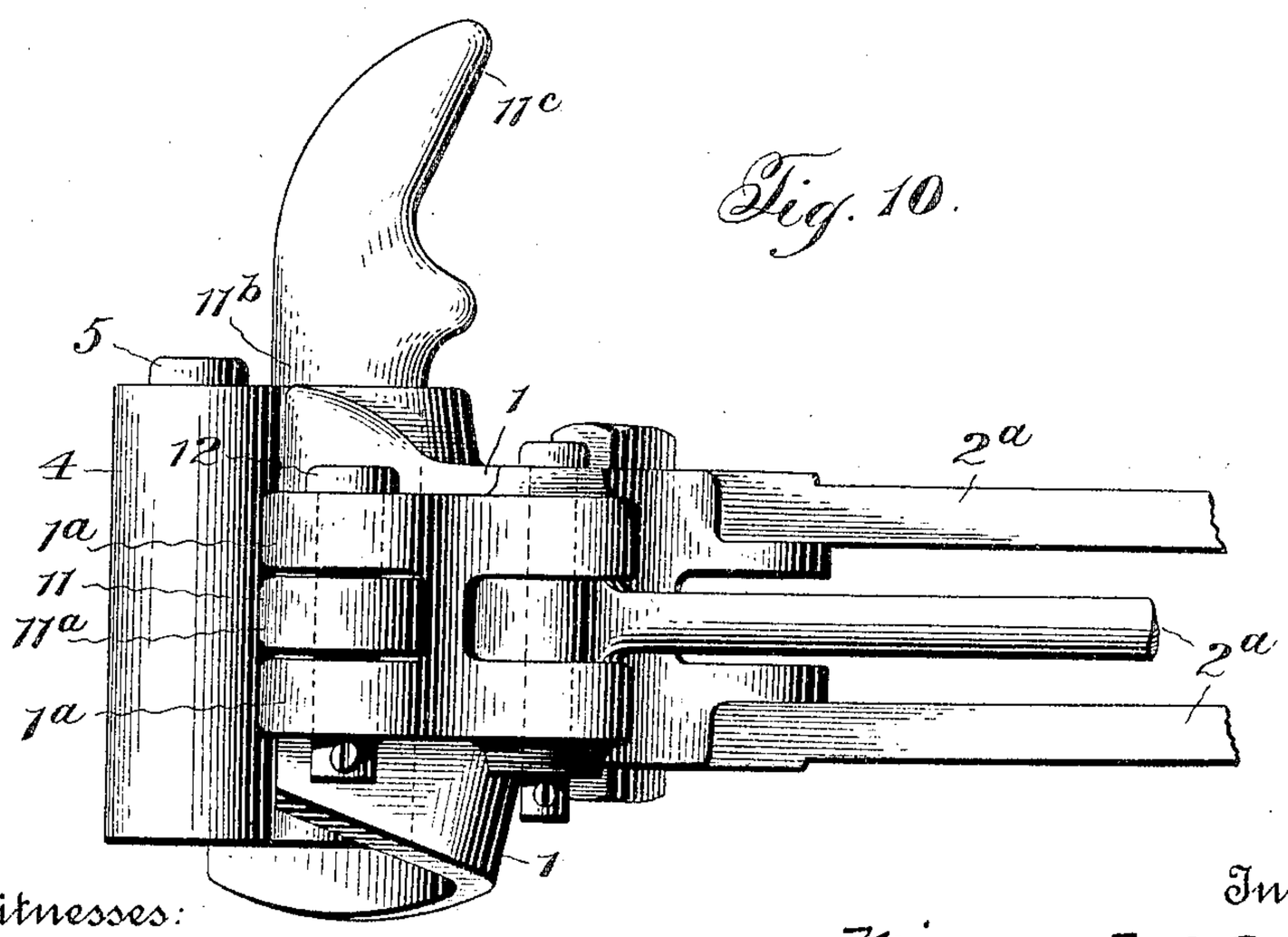


Fig. 10.



Witnesses:

Jas. E. Hutchinson

F. P. Ritter

Inventor

William McConway Jr.

by F. W. Ritter Jr.

Attorney

UNITED STATES PATENT OFFICE.

WILLIAM McCONWAY, JR., OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO THE McCONWAY & TORLEY COMPANY, OF PITTSBURG, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

CAR-COUPLING.

No. 813,107. Specification of Letters Patent. Patented Feb. 20, 1906.

Application filed August 8, 1905. Serial No. 273,267.

To all whom it may concern:

Be it known that I, WILLIAM McCONWAY, Jr., a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Car-Couplings; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to the construction of couplings for railway-cars, and has for its object to produce a simple, efficient, and easily-manipulated device whereby a car or the like equipped therewith may be readily coupled with other cars, whether the latter be provided with couplers of the vertical-plane or Master Car-Builders' type or with link or chain couplings or with coupling devices of the character of this invention.

To this end my invention, generally stated, may be said to reside in a construction wherein a suitably-formed hook or equivalent link-engaging device is pivotally mounted upon the head of a car-coupler of the vertical-plane or Master Car-Builders' type, said hook member or link-engaging device being adapted to actuate and to control the movements of the usual coupler-knuckle and being itself restrained in locked or coupled position by means of said knuckle and its locking mechanism.

There are other features of invention residing in particular combinations and elemental construction, all as will hereinafter more fully appear.

In the drawings chosen to illustrate the preferred form of my invention, the scope whereof is pointed out in the claims, Figure 1 is a plan view of a coupler embodying my invention shown in connection with the adjacent portion of a car, the relative positions the several parts occupy when the link-engaging member is in locked or coupled position being shown in full lines and the open or uncoupled position of the link-engaging member and the knuckle being shown in dotted lines. Fig. 2 is a side elevation of the coupler and a portion of the end of the car to which it is attached, the parts being in the coupled position illustrated in Fig. 1. Fig. 3 is an inverted plan view of the coupler, the several parts being positioned preparatory to coupling with another car provided with a vertical-plane coupler or with a coupler of the form of the present invention. Fig. 4 is a vertical section taken in the plane of the line 4 4, Fig. 1, illustrating one form of lock, knuckle, and knuckle-opening mechanism. Fig. 5 is a view similar to Fig. 1, but illustrating a modified form of my invention. Fig. 6 is a front elevation of the modified form of my invention illustrated in Fig. 5, the parts being shown in the positions they occupy when the link-engaging member is in locked or coupled position. Fig. 7 is a plan view of a coupler embodying my invention, illustrating a knuckle and locking mechanism of different forms from those previously shown. Fig. 8 is a vertical section of the coupler shown in Fig. 7, taken in the plane of the line 8 8 thereof. Figs. 9 and 10 are a plan and side elevation, respectively, of a construction embodying my invention, the coupler-head being attached to a plurality of stems.

Like symbols refer to like parts wherever they occur.

I will now proceed to describe my invention more fully, so that others skilled in the art to which it appertains may apply the same.

In so far as this device corresponds to couplers of the vertical-plane type it is obvious that any of the various well-known forms may be employed.

In the drawings, 1 is a coupler having a shank 2, which is attached to suitable draft-rigging appliances (not shown) in any desired manner, the coupler being supported at the forward end of the car by the carry-iron 3.

The head of the coupler, which may be of any usual or particular form desired, is provided with a knuckle 4 of such configuration as to properly coöperate with the form of head and locking mechanism employed, said knuckle being pivotally attached to the head by the knuckle-pin 5 or in other suitable manner. A lock or locking mechanism 6 is provided for the knuckle, the said knuckle and its lock being formed in any desired or well-known manner to coact with each other, and, if desired, the mechanism may be adapted to perform other functions, such as supporting the lock in unlocked position until

the knuckle is subsequently opened, locking the lock against an accidental unlocking or automatically opening the knuckle, all in a manner well known.

In the constructions shown in Figs. 1 to 6, inclusive, the vertically-sliding lock 6 is of a form adapted to coöperate with a knuckle-opener and lock-set or lock-supporting member 7, and for this purpose is provided with a notch or cavity 6^a and with a lug or projection 6^b below the same. The lock-set and knuckle-opener member 7, which is preferably secured in the coupler-head in such manner that it may have a slight freedom of movement in all directions about its pivotal point or pivot-pin 8, is provided with a plurality of lugs or fingers, one of which, 7^a, is adapted to enter the notch or socket 6^a of the lock to support the same in an unlocked position and is also adapted to be engaged by the lug or projection 6^b of the lock to cause a rotation of the member 7 when the lock is raised above a certain point. The lug or finger 7^b of the lock-set and knuckle-opener member 7 normally stands slightly above the knuckle and in the path of movement of the double inclined projection 4^a, which is formed upon the tail of the said knuckle 4. The depending finger 7^c, with which the member 7 is provided, extends downwardly behind the tail of the knuckle 4, and when the said member 7 is caused to rotate through the operation of the lock 6 engages the rear of said knuckle-tail to cause an outward rotation or opening thereof.

In the construction shown in Figs. 7 and 8 no mechanism is provided for performing either the function of setting the lock preparatory to opening or for automatically opening the knuckle. The lock 6 shown therein is a vertically-sliding pin having an inclined or beveled face a^6, the tail of the knuckle 4 being so formed that it engages said inclined face upon a closing or locking movement of said knuckle, whereby the lock is forced upwardly to permit the knuckle-tail to pass, the lock thereafter falling by gravity in front of said knuckle-tail, and thus locking the coupler.

In connection with the lock shown in Figs. 7 and 8 a well-known form of device for preventing an accidental unlocking thereof is illustrated. This device b^6 is housed within a slot in the lock, its lower end extending beneath a portion of the coupler-head when the lock 6 is in locked position. When, however, the lock is raised through the agency of the uncoupling-lever 9, the first movement of the latter causes the withdrawal of the head of the auxiliary locking device b^6 from beneath the adjacent portion of the coupler-head, the lock being thereafter freely raised by the further movement of the said uncoupling-lever.

The uncoupling-lever 9, by means of which the lock 6 is caused to assume an unlocked position, is or may be of the usual and well known form and may be connected to the lock 6 in any suitable manner. Preferably, however, the connection 10 between the lock 6 and uncoupling-lever 9 consists of a plurality of relatively slidable parts 10^a and 10^b, which are telescoping with respect to each other in such manner that the opening for the bight of a coupling-link between the hook 11^c and lock 6 in a construction such as shown in Figs. 1, 2, 3, and 4 is not impeded.

While the connection 10 may be formed in any desired manner, it is preferred to rivet the parts 10^a and 10^b thereof together after they are in position by upsetting the end of the member 10^a to form a rivet-head.

Referring now more particularly to the novel features of construction which form operative combinations with parts of a vertical-plane coupler of such character or functions as heretofore described, 11 is a link-engaging member which is preferably pivotally mounted upon the guard-arm side of the coupler-head between perforated lugs 1^a 1^a, integral with the latter, a pivot-pin 12 passing through said link-engaging member and said lugs. The said link-engaging member 11 preferably consists of a horizontally-extending arm 11^a, a knuckle-actuating portion 11^b, and a hook or equivalent portion 11^c.

The horizontally-extending arm 11^a, the inner contour of which may conform to the contiguous face of the coupler-head, carries at the end opposite its pivotal point the vertically-extending knuckle-actuating portion or member 11^b, the latter being preferably of general cylindrical or columnar form and integral therewith. The hook portion 11^c or equivalent device for receiving a coupling-link may be attached to or formed on the link-engaging member 11 at any suitable point, but is preferably integral with the knuckle-actuating portion 11^b in order that the draft may be maintained central or approximately central of the device.

Two forms of the hook member 11^c are shown in the drawings. In Figs. 1, 2, 3, 7, 9, and 10 the hook member 11^c rises vertically from and is preferably formed integral with the knuckle-actuating portion 11^b of the link-engaging member 11, while in Figs. 5 and 6 said hook 11^c extends horizontally outward from the knuckle-actuating member 11^b, passing through a suitable slot or bifurcation in the face of the knuckle 4.

As a preferred means for controlling the movements of the link-engaging member 11 a horizontally-extending controlling-lever 13 is pivotally mounted upon the coupler-head, so that it has the same axis of rotation as the said link-engaging member. For this purpose said rotatable lever 13 may be formed with a boss 13^a, through which passes the pivot-pin 12, upon which said link-engaging member 11 is mounted, a nut 14 being em-

ployed to retain said lever in proper position. One arm of the lever 13 extends toward the knuckle-actuating portion 11^b of the link-engaging member 11 and is provided with a vertical lug 13^b, having a reduced cylindrical extension which enters a corresponding socket or cavity in the base of the said knuckle-actuating portion or member 11^b. The other arm of the controlling-lever 13 is preferably formed with a slot 13^c, adapted to receive and form a pin-and-slot connection with the arm 15^a of the hook-coupling-operating member 15, said slot 13^c being preferably of cam form to more easily permit the coöperation of the parts and to permit a complete actuation of the said lever with a comparatively small movement of the operating member 15.

The hook-coupling-operating member 15 is preferably a bar or rod having an arm 15^a for engagement with the slotted arm of the controlling-lever 13 and having handholds 15^b at each end thereof. As a means of attaching the operating-bar 15 to the car suitable stirrups or hangers 16 may be employed, such hangers being preferably of sufficient width to permit a slight lateral movement of the said operating-bar 15 in the direction of length of the car, whereby the arm 15^a of such bar may accommodate itself to the various positions of the slotted arm of the lever 13 without binding upon the same.

The operating member 15 extends transversely of the car, so that one of the handles or handholds 15^b is accessible from each side of the car.

In the construction shown in Figs. 9 and 10 sufficient only of the novel features of my invention have been illustrated to show the applicability thereof to couplers of the type wherein the head is flexibly attached to the draft-rigging appliances, as by means of a plurality of suitably-formed stems 2^a, which are pivotally connected to said coupler-head.

The construction being substantially such as hereinbefore pointed out, the operation of the device will be as follows: When the several parts of the device are in the relative position illustrated in full lines in Figs. 1, 2, 4, 5, 6, 7, 8, 9, and 10, a coupling may be made with a link. In such position the bight of a link may be engaged with the hook 11^c of the link-engaging member 11, the latter being locked in position by the engagement of the knuckle-actuating portion or member 11^b thereof and the knuckle 4, said knuckle 4 being itself locked, and therefore restrained from outward rotation by the lock 6, which obstructs the path of the knuckle-tail. If now the parts are in a link-coupled position, as just described, and it is desired to make a coupling with a car equipped with a vertical-plane coupler of the Master Car-Builders' type or with a coupler of the character of this invention, the uncoupling-lever 9 may be manipulated to bring the lock 6 to an unlocked position, after which and while said lock is in such position the hook-coupling operating member 15 is pulled or pushed longitudinally in the proper direction, depending upon which side of the car the operator may stand. When the operating-bar 15 is properly actuated, the arm 15^a thereof, which engages the cam-slot 13^c of the controlling-lever 13, causes a rotation of said controlling-lever 13 in an uncoupling direction, and as the latter engages the knuckle-actuating portion 11^b of the link-engaging member 11 such link-engaging member is rotated horizontally outward to an open or uncoupled position in which it does not obstruct the coupling movements of a knuckle, such as 4. As the link-engaging member 11, bearing the hook 11^c, is rotated to an uncoupled position the knuckle 4 is also opened through the agency of the knuckle-actuating portion 11^b of the said member 11, the latter pressing upon the outer end of the knuckle 4, with which it contacts, until the knuckle is substantially fully opened. Such open or uncoupled position of the link-engaging member 11 and knuckle 4 are illustrated in Fig. 3 and in dotted lines in Figs. 1 and 5. When the link-engaging member 11 is in its open or uncoupled position, the device may be coupled by impact with a vertical-plane coupler of the Master Car-Builders' type or with a device such as this invention, in which the link-engaging member is also in an open or uncoupled position. In either case the knuckle of the coupler on the other car is caused to engage the corresponding knuckle 4 in a well-known manner, the lock 6 assuming a locked position when the said knuckle is fully closed, and thus completing the coupling of the cars.

It is to be noted that the knuckle 4 of this device after having been opened, as above described, may be closed or brought to a coupled position independent of and without actuating the link-engaging member 11, the latter having been rotated sufficiently far to one side to be clear of the path of the said knuckle 4 during a closing movement thereof.

Should the parts be in an open or uncoupled position and the car with which a coupling is to be made be provided only with a link or chain coupling, the link-engaging member 11 may be returned to and locked in a coupled position by moving the hook-coupling-operating member or bar 15 in the proper direction to cause the slot-engaging arm 15^a thereof to rotate the lever 13 about its pivot 12. Such rotation of the controlling-lever 13 induces a corresponding rotation of the coacting link-engaging member 11, the knuckle-actuating portion 11^b whereof forces the knuckle 4 to a closed position by impinging upon and forcing the tail of said knuckle inward while itself moving to a closed or coupled position. When the knuckle 4 is re-

turned to its coupled position, the lock 6 assumes a locked position and the link-engaging member 11 is locked in coupled position.

When lock-actuated knuckle-opening devices are employed, both the link-engaging member 11 and knuckle 4 may be rotated outward to an uncoupled position by the unlocking operation of the knuckle-locking mechanism, the said link-engaging member 11 by reason of its arrangement relative to the knuckle 4 being acted upon by the tail of the latter. So, also, by a mechanism such as this the knuckle 4 may be rotated outward to an open position independently of the link-engaging member 11 when the latter is in open or uncoupled position.

The operation of a mechanism of this character such as heretofore described is as follows: The lock 6 being lifted through the manipulation of the uncoupling-lever 9, the lug 7^a of the member 7 gravitates into engagement with the notch or cavity 6^a of the lock when said lug and notch come into apposition. In this position of the parts the lock is maintained in an unlocked position until the knuckle 4 is subsequently opened. As the knuckle 4 opens the double-inclined lug 4^a upon the tail thereof engages the trip-lug 7^b of the member 7 and rotates the lug 7^a backwardly out of engagement with notch 6^a, the lock 6 then dropping upon the hook portion of the tail of the knuckle and being supported thereon until the knuckle is again returned to a closed position, at which time, the support of the tail of the knuckle being removed, said lock 6 drops in front of the tail of the knuckle and locks the same. If the lock 6 is raised sufficiently to cause the lug 6^b thereof to engage the lug 7^a of the member 7, the continued upward movement of said lock will cause an extended rotation of the lock set and knuckle-opener member 7 about its pivot 8, thus causing the depending finger 7^c thereof to engage the rear of the knuckle-tail and force said knuckle 4 to an open position. When the knuckle 4 is thus opened, the lock 6 drops upon the tail of the said knuckle and is supported thereon until returned to a locked position by the closing of the knuckle, as before described.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a car-coupler, the combination with a coupler-head, of a plurality of relatively movable members pivotally mounted on said head, each of said members being integral and permanently mounted upon the head and being adapted to form a coupling with a complementary member, and means for locking said pivotally-mounted members in coupled position.

2. In a car-coupler, the combination with a coupler-head, of a plurality of horizontally-movable members pivotally mounted on said head, each of said members being integral and permanently mounted upon the head and being adapted to form a coupling with a complementary member, and means for locking said pivotally-mounted members in coupled position.

3. In a car-coupler, the combination with a coupler-head, of a knuckle pivotally mounted thereon, and horizontally-rotatable means pivotally mounted on said head adapted to engage a link, said means consisting of integral devices permanently mounted on said head.

4. In a car-coupler, the combination with a coupler-head, of a knuckle pivoted thereon, and integral devices pivotally mounted on the guard-arm side of said head adapted to engage a link, said integral devices being horizontally rotatable to coupled and uncoupled positions.

5. In a car-coupler, the combination with a coupler-head, of a knuckle pivoted thereon, a link-engaging member horizontally rotatable to coupled and uncoupled positions, means for locking said link-engaging member in coupled position, and means whereby said link-engaging member may be caused to actuate said knuckle.

6. In a car-coupler, the combination with a coupler-head, of a knuckle, means for locking said knuckle in coupled position, pivotally-mounted link-engaging means adapted to be locked in coupled position by said knuckle and said locking means, and means whereby said link-engaging member may be caused to actuate said knuckle.

7. In a car-coupler, the combination with a coupler-head, of a knuckle, and a link-engaging member adapted to actuate said knuckle.

8. In a car-coupler, the combination with a coupler-head, of a knuckle, and a link-engaging member adapted to open said knuckle.

9. In a car-coupler, the combination with a coupler-head, of a knuckle, and a link-engaging member adapted to close said knuckle.

10. In a car-coupler, the combination with a coupler-head, of a knuckle, and a link-engaging member adapted to both open and close said knuckle.

11. In a car-coupler, the combination with a coupler-head, of a knuckle, a lock for said knuckle, means operative by the lock for opening said knuckle, and a lever system independent of the lock-actuated opening means for opening said knuckle.

12. In a car-coupler, the combination with a coupler-head, of a knuckle, a lock for said knuckle, means independent of the operation of the lock for opening said knuckle, and means for closing said knuckle.

13. In a car-coupler, the combination with a coupler-head, of a pivoted knuckle, a horizontally-rotatable member pivoted on said

head, said member being rotatable to coupled and uncoupled positions and being provided with a hook integral therewith, and means for locking said horizontally-rotatable member in coupled position.

14. In a car-coupler, the combination with a coupler-head, of a pivoted knuckle, a lock for said knuckle, a movable member provided with a hook, and means whereby said knuckle and said movable member may be rotated to uncoupled position through the operation of said lock.

15. In a car-coupler, the combination with a coupler-head, of a knuckle, a pivoted link-engaging member, means for locking said link-engaging member in coupled position, and means for causing said link-engaging member to assume both a coupled and an uncoupled position.

16. In a car-coupler, the combination with a coupler-head, of a knuckle, a link-engaging member pivotally mounted on said head, means for locking said knuckle and said link-engaging member in coupled position, means for simultaneously unlocking said knuckle and said link-engaging member, and means for simultaneously rotating said knuckle and said link-engaging member to uncoupled positions.

17. A link-engaging member for a car-coupler provided with a pivoted knuckle, said member having a hook portion and a knuckle-actuating portion adapted to be interposed between the inner face of the outer end of a knuckle and the coupler-head.

18. In a car-coupler, the combination with a coupler-head, of a knuckle, a link-engaging member horizontally rotatable to coupled and uncoupled positions and having a hook portion, and means for simultaneously locking said knuckle and said link-engaging member.

19. In a car-coupler, the combination with a coupler-head, of a knuckle, a link-engaging member pivotally mounted upon the guard-arm side of said head, a member pivotally mounted in the same axis with said link-engaging member, and means for causing a pivotal movement of said last-named member, whereby said link-engaging member is actuated.

20. In a car-coupler, the combination with a coupler-head, of a knuckle, a link-engaging member pivotally mounted upon the guard-arm side of the coupler-head, a member pivotally mounted in the same axis with said link-engaging member, and a hook-coupling-operating member having a pin-and-slot connection with said last-named member.

21. In a car-coupler, the combination with a coupler-head, of a knuckle, a lock for said knuckle, a link-engaging member pivotally mounted upon said coupler-head, a lever pivotally mounted upon the coupler-head and having one arm engaging said link-engaging member and another arm engaging a hook-coupling-operating member, and a hook-coupling-operating member.

22. In a car-coupler, the combination with a coupler-head, of a knuckle, a lock for said knuckle, a link-engaging member pivotally mounted upon said coupler-head, a pivotally-mounted lever having a cam-slot, and a hook-coupling-operating member engaging the cam-slot of said lever.

23. In a car-coupler, the combination with a coupler-head, of a knuckle, a lock for said knuckle, a link-engaging member, and a telescoping connection adapted to attach said lock to an uncoupling-lever.

24. In a car-coupler, the combination with a coupler-head, of a knuckle, a lock for said knuckle, a link-engaging member adapted to close said knuckle, and means independent of the said link-engaging member for opening said knuckle.

25. In a car-coupler, the combination with a coupler-head, of a knuckle, a lock for said knuckle, a link-engaging member adapted to both open and close said knuckle, and means independent of said link-engaging member for opening said knuckle.

26. In a car-coupler, the combination with a coupler-head, of a knuckle, a lock for said knuckle, and means for opening said knuckle, the said knuckle-opening means being unaffected by the closing of said knuckle.

27. In a car-coupler, the combination with a coupler-head, of a knuckle, a link-engaging member pivotally mounted on said head, means for locking said link-engaging member, and means for maintaining said locking means in unlocked position whereby said link-engaging member may be subsequently brought to uncoupled position.

28. In a car-coupler, the combination with a coupler-head, of a knuckle, a lock for said knuckle, a link-engaging member pivotally mounted on said head, and means whereby said link-engaging member may be actuated from both sides of the car.

29. In a car-coupler, the combination with a coupler-head, of a knuckle, a pivotally-mounted link-engaging member having a columnar portion and a hook extending vertically upward therefrom, means for simultaneously locking said knuckle and said link-engaging member in coupled positions, and means for simultaneously opening said knuckle and said link-engaging members.

30. In a car-coupler, the combination with a coupler-head, of a knuckle, an integral link-engaging member pivotally mounted on said head, and means whereby said link-engaging member may be locked in coupled position while said knuckle is in coupled position, said link-engaging member being rotatable horizontally to permit the knuckle to engage a corresponding knuckle.

31. In a car-coupler, the combination with

a coupler-head, of a knuckle, a lock for said knuckle, and a member pivotally mounted independent of the knuckle and adapted to both open and close said knuckle.

32. In a car-coupler, the combination with a coupler-head, of a knuckle, and a pivotally-mounted link-engaging member adapted to actuate said knuckle.

33. In a car-coupler, the combination with a coupler-head, of a knuckle, a lock for said knuckle, and a link-engaging member having a hook portion integral therewith, said link-engaging member being adapted to be engaged and locked in coupled position by the said knuckle and to be actuated by said knuckle.

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

WILLIAM McCONWAY, JR.

Witnesses:

J. H. BAILEY,

GEO. W. MCCANDLESS.