

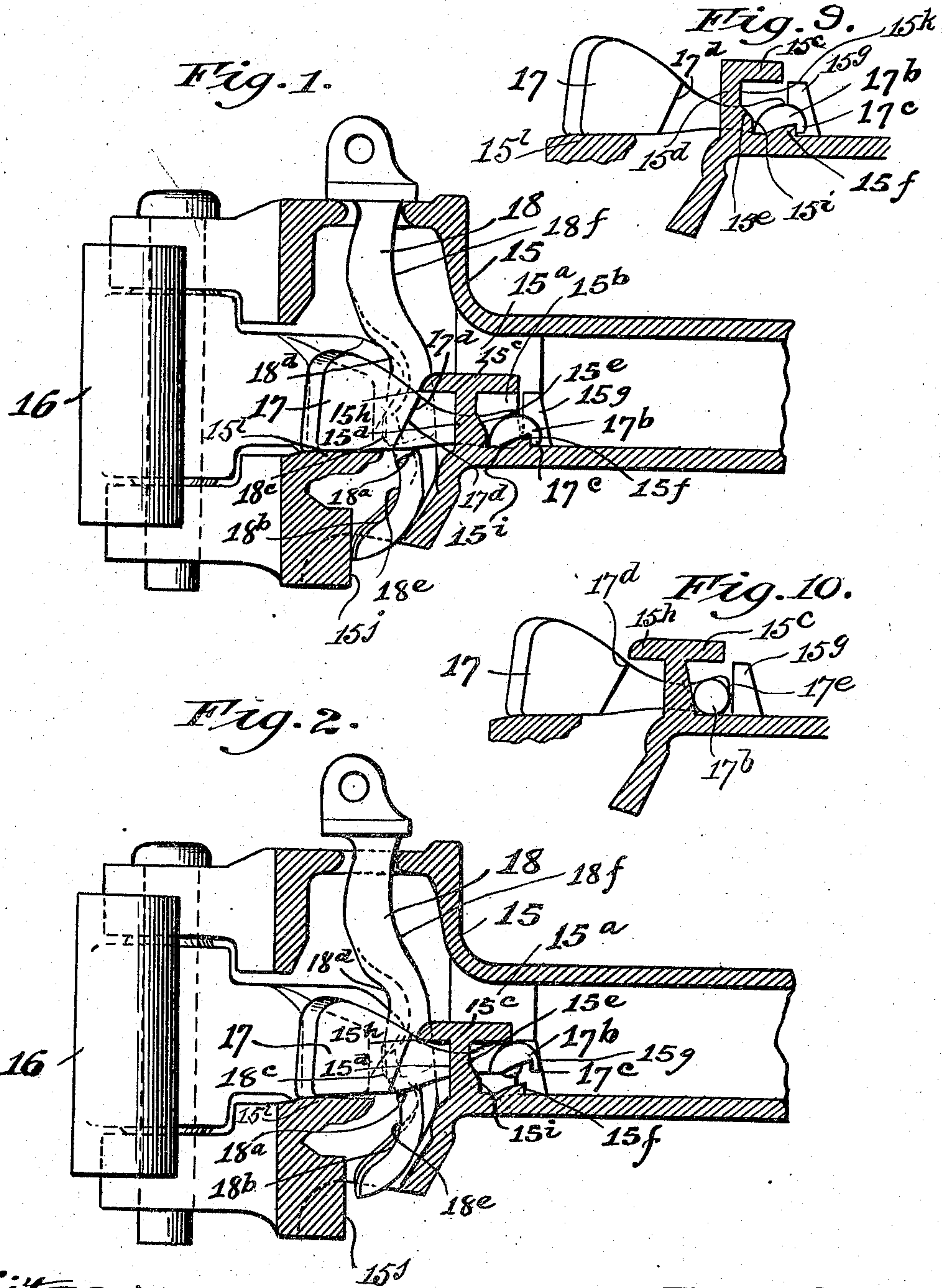
R. E. L. JANNEY, E. P. KINNE & W. E. TRUMP.
CAR COUPLING.

APPLICATION FILED MAY 16, 1908.

Patented Nov. 24, 1908.

4 SHEETS—SHEET 1.

905,078.



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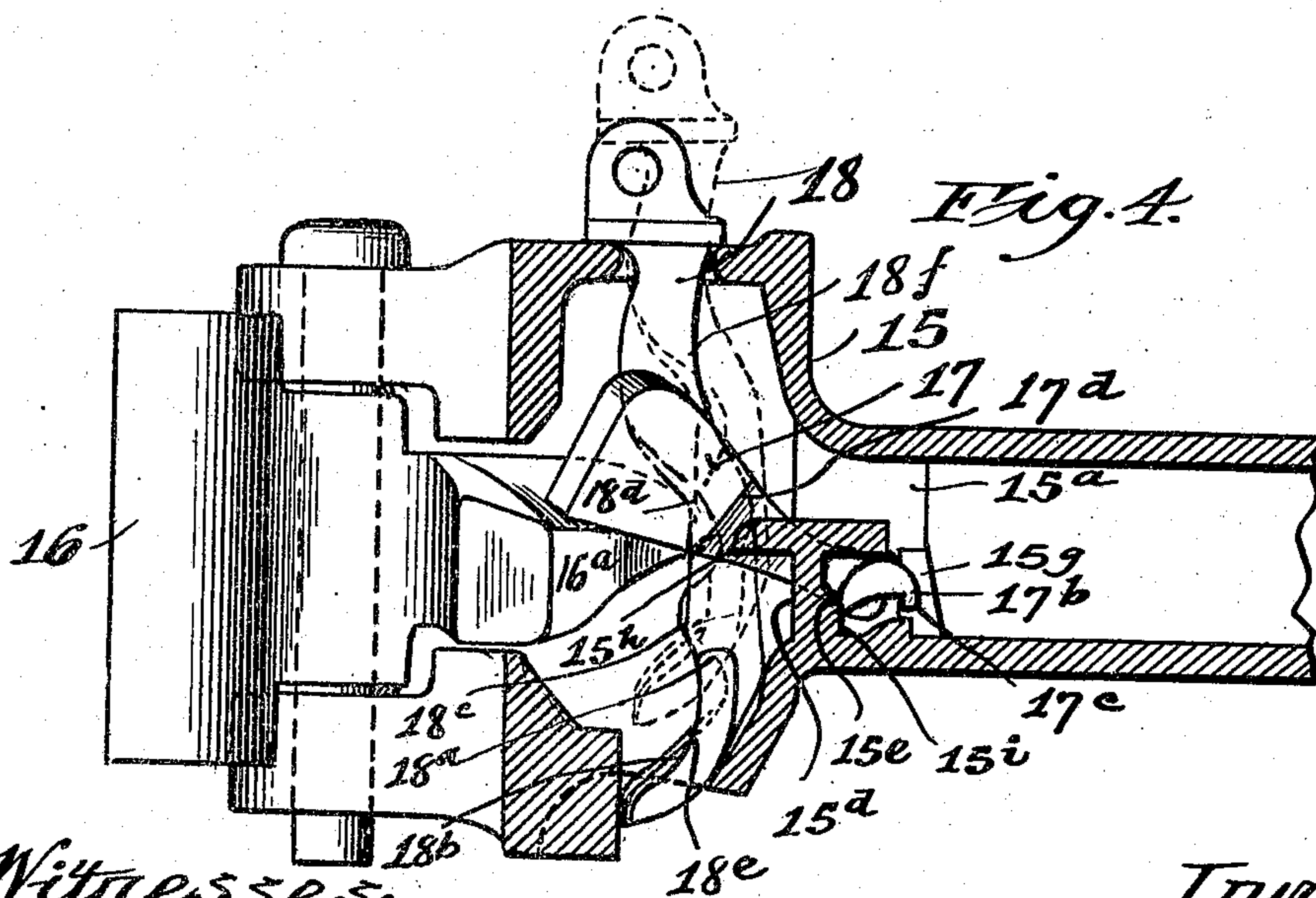
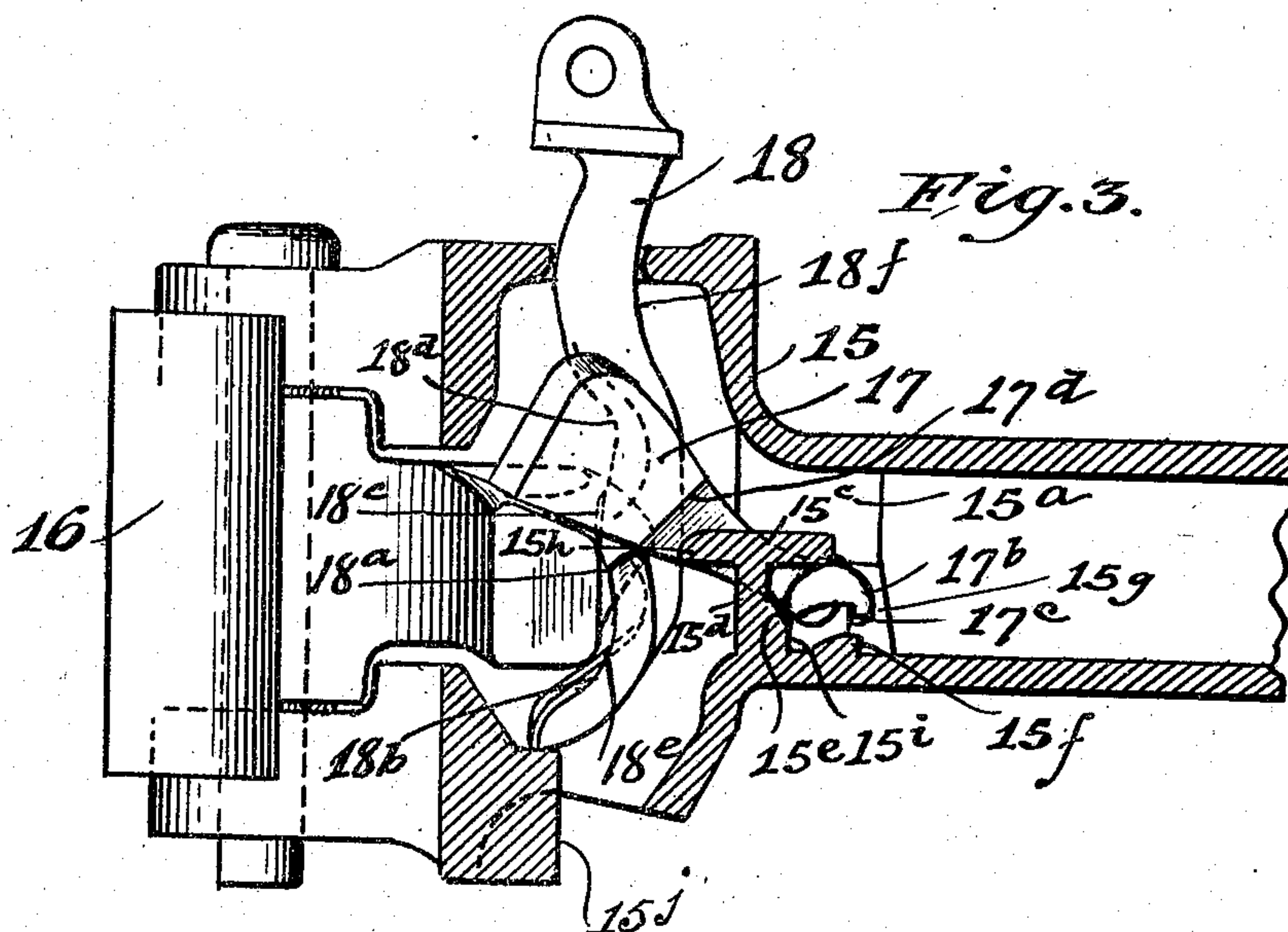
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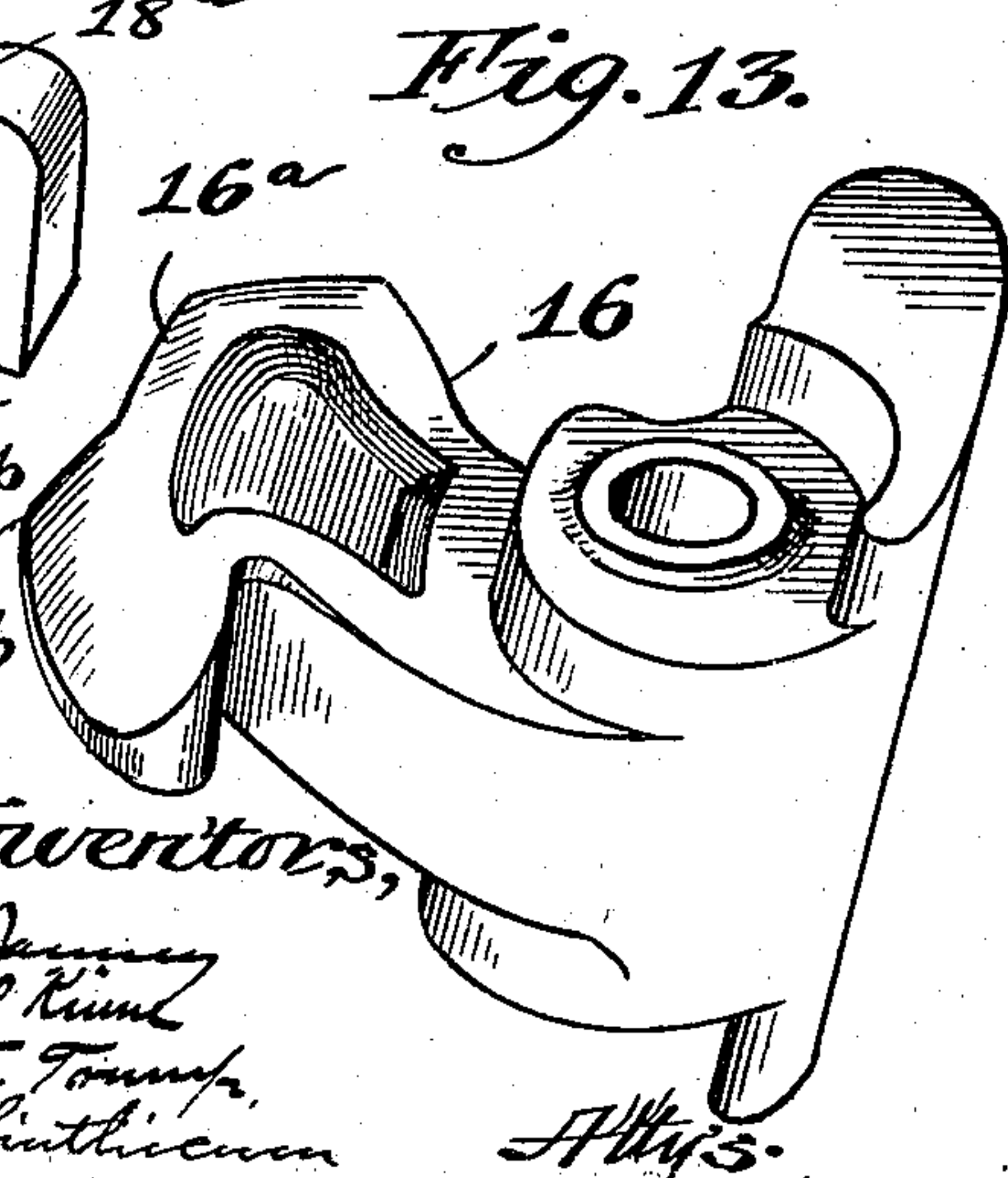
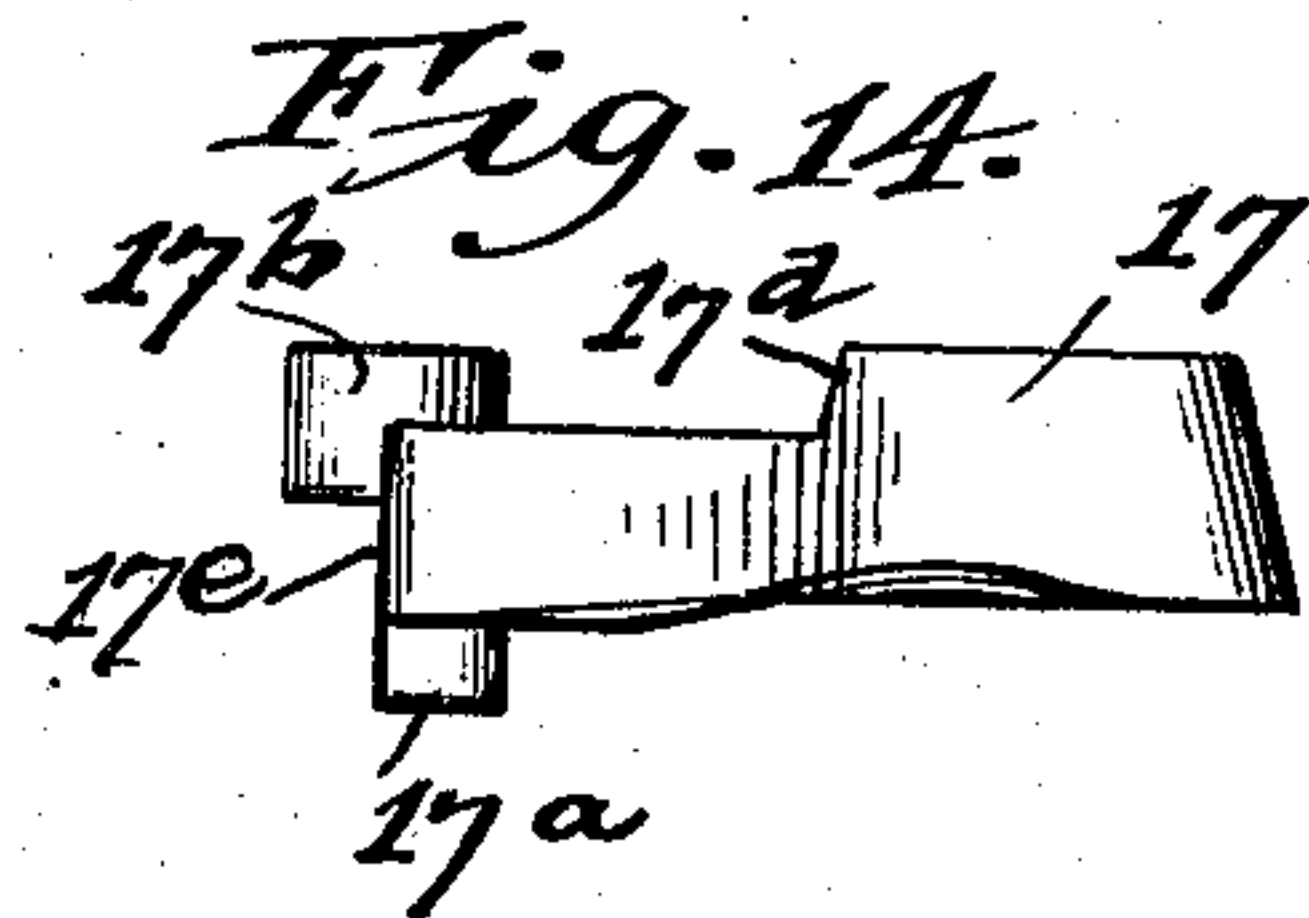
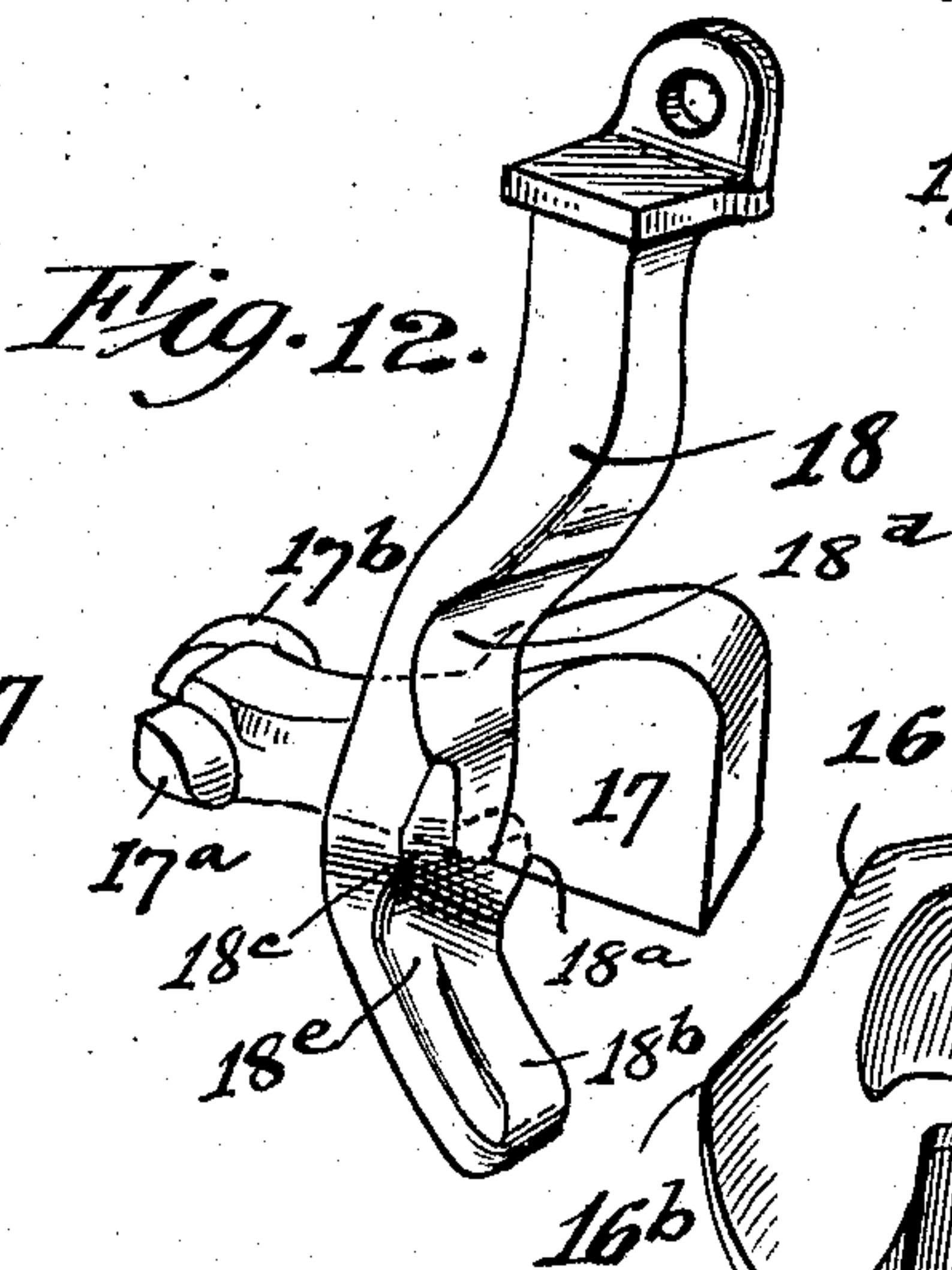
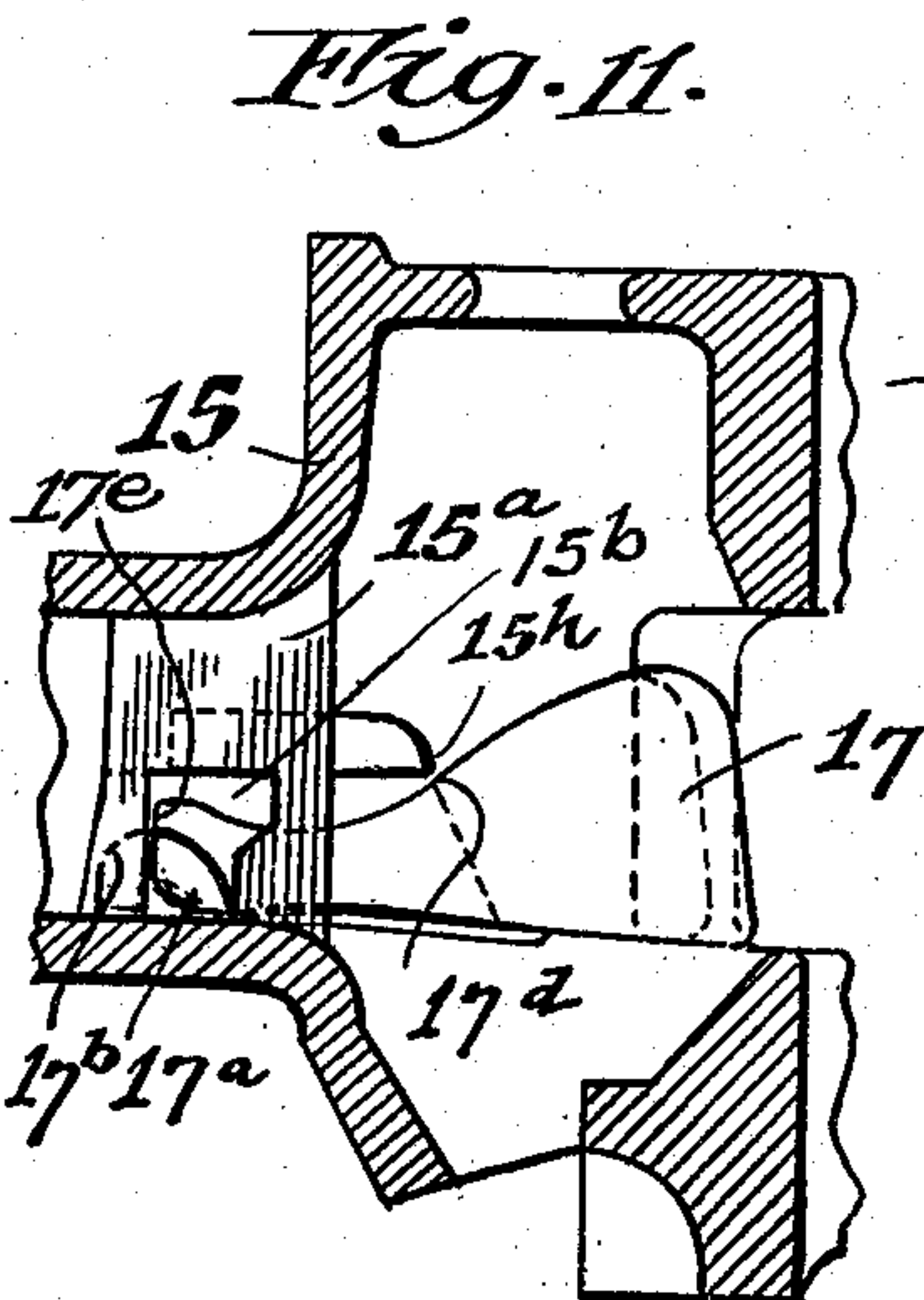
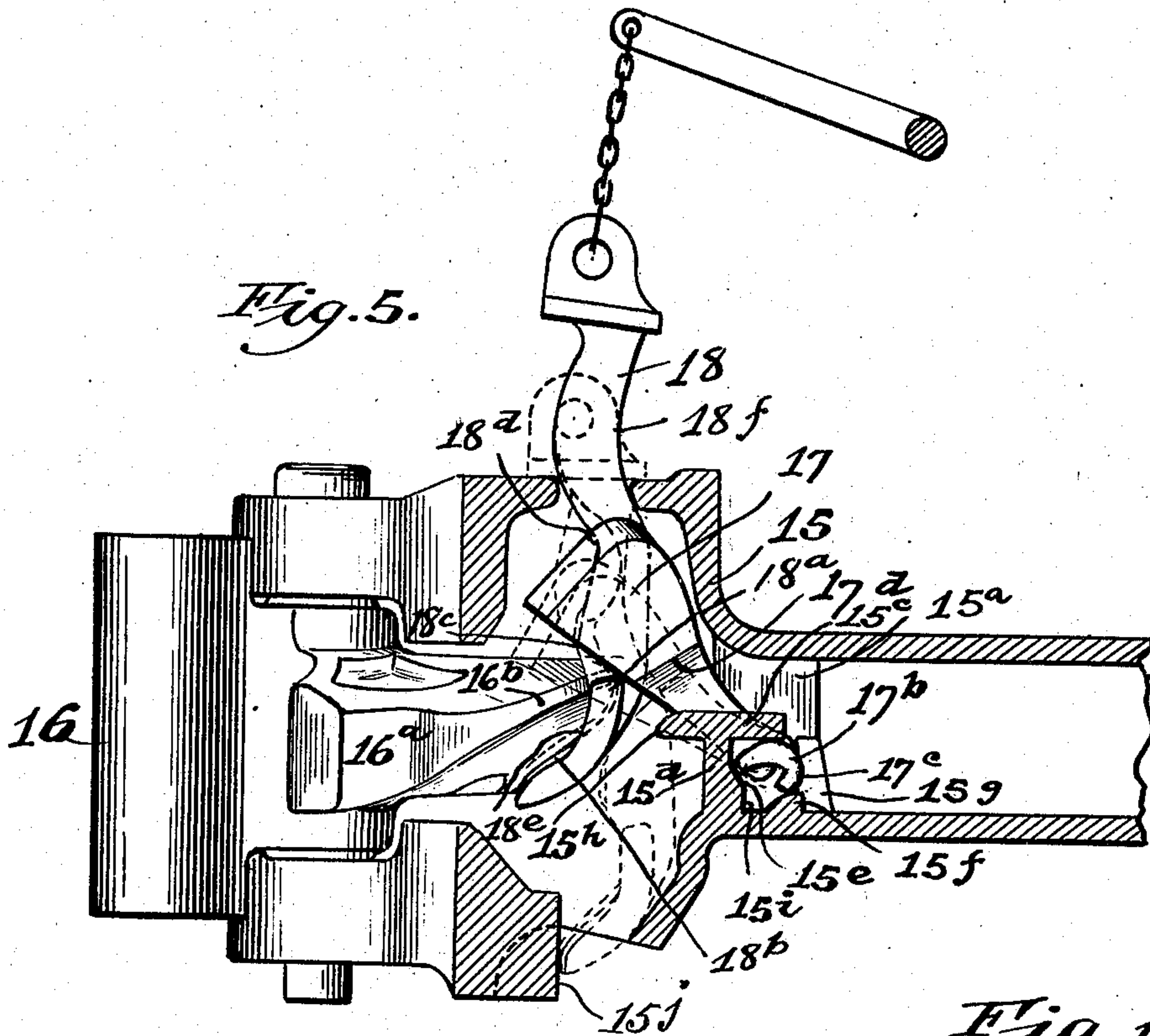
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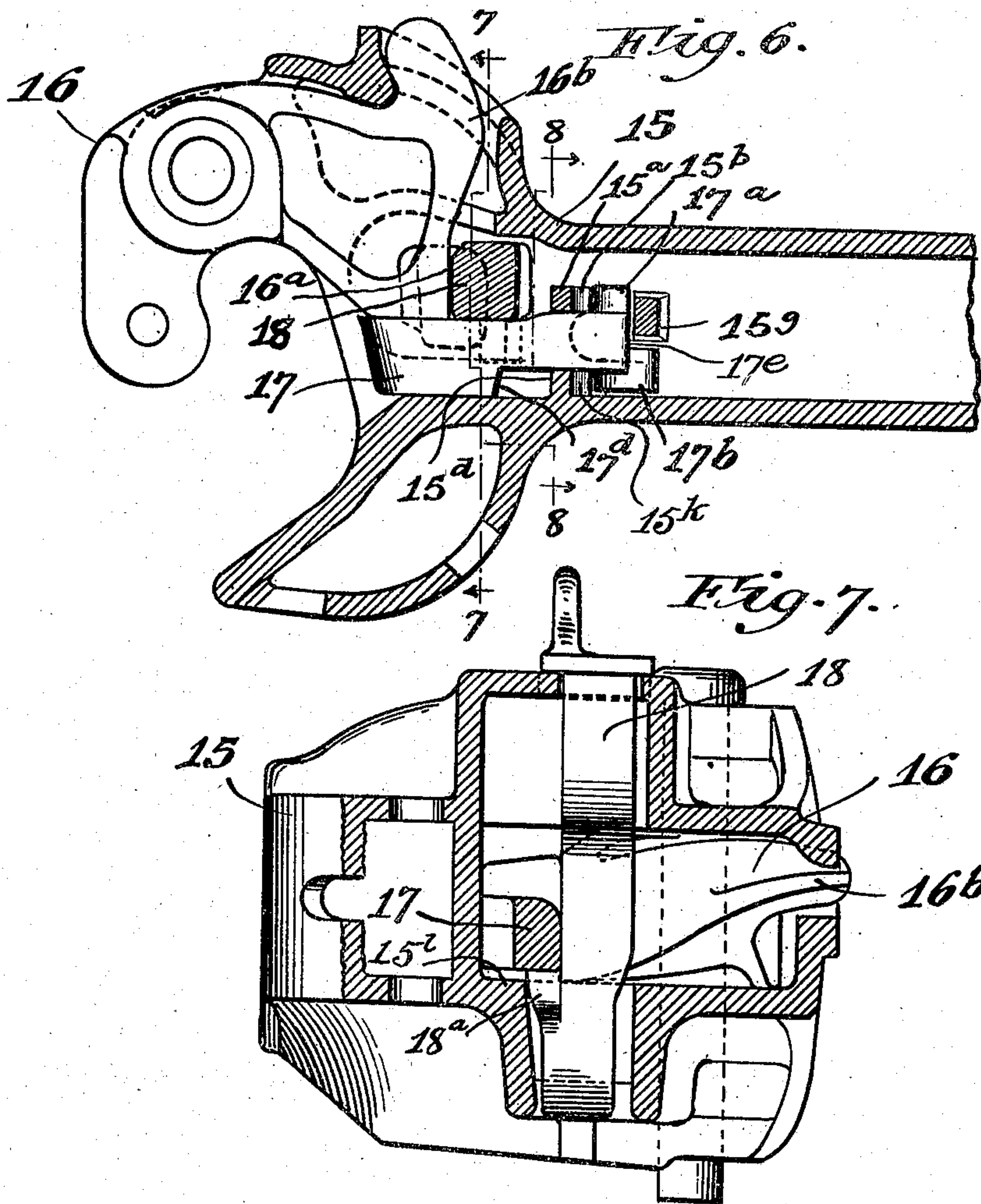
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Fig. 8.
15a, 15c, 17a, 17b, 159, 17, 15
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UNITED STATES PATENT OFFICE.

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CAR-COUPLING.

No. 905,078.

Specification of Letters Patent.

Patented Nov. 24, 1908.

Application filed May 16, 1908. Serial No. 433,308.

To all whom it may concern:

Be it known that we, ROBERT E. L. JANNEY, of Chicago, county of Cook, State of Illinois, and EDMUND P. KINNE and WILLIAM E. TRUMP, of Alliance, county of Stark, State of Ohio, have invented certain new and useful Improvements in Car-Couplers, of which the following is a specification.

Our invention relates to that class of couplers of the M. C. B. type which employ a pivoted knuckle, a lock therefor, and a lifter for operating the lock. A coupler of this general type is disclosed in the patent to Schroeder of August 6, 1907, No. 862,204. There are two general types of M. C. B. couplers, in one of which the lock is supported on the tail of the knuckle when the latter is open, and drops back into locking position when the knuckle is closed in coupling. In this type of coupler the lock, or its operating means, projects, when the knuckle is open, through the wall of the coupler-head, and beyond its normal position when the knuckle is closed, and is exposed to the danger of breaking during the act of coupling. In the other type of coupler, such as the original Janney, the lock is in the normal or lower position when the knuckle is open and must be again moved when the coupling is made. The first described type of coupler is usually preferred because of the greater facility of coupling, the lock simply falling by gravity into the locking position when it is freed from the tail of the knuckle. In these classes of couplers also the lock and lifter are sometimes combined in a single piece, typified by a vertically-moving lifting and locking pin, but in some instances, as in the Schroeder patent above mentioned, the lock is disposed wholly within the head of the coupler and is operated by a separate lifting mechanism which extends through the wall of the coupler. It is desirable to provide a lock of such size and strength as to withstand all of the shocks and strains of service and to inclose it wholly within the head of the coupler so as to protect it against contact with parts extraneous to the coupler. It is also desirable to provide a means for lifting the lock and opening the knuckle which shall be strong and not liable to be broken when the cars are thrown together in coupling, but

this latter object is defeated when these lifting means are left exposed beyond their normal position.

It is the general object of our invention, therefore, to provide a coupler which shall have a strong and substantial lock wholly inclosed within the coupler-head; which will be maintained in position to allow the knuckle to be closed without being again moved or lifted; and which shall have a strong and substantial means for lifting the lock and opening the knuckle, such lifting and opening means being acted upon by the knuckle only during the opening movement and exposed beyond the normal position only during the act of uncoupling. These several objects we attain in a coupler in which the uncoupling mechanism is adapted to the M. C. B. standard type of chain and clevis.

In our construction we employ a lock and a separate lifter but so construct and arrange these parts with reference to each other and the tail of the knuckle that when the lifter is disengaged from the lock-set by the opening of the knuckle it will drop to its original position and so remain during the whole movement of the knuckle, while the lock will remain supported by the knuckle tail.

Another feature of our invention relates to the provision of means for preventing the creeping of the lock while under draft. We apply the anti-creeping provisions to the lock itself and the lock falling by gravity to its normal position renders them effective and the lock cannot creep or move toward the released position by any movement of the knuckle but must be moved to a different position by the lifter before it can be moved toward its unlocking position. These anti-creeping provisions are functionally independent of the lifter and of the draft.

We are aware that gravity locks have been provided with anti-creeping provisions so that when the lock falls by gravity some part thereof engages the draw-head or the lifter and is moved initially by the lifter from this position when opening the lock, but in such former constructions this anti-creeping provision did not prevent the lock from being moved by the tail of the knuckle out of engagement with the anti-creeping provision.

In the accompanying drawings, Figure 1. is a vertical longitudinal sectional view of our improved coupler showing the coupler closed and locked and the lifter down. Fig. 2. is a similar view showing the lifter partly raised and disengaging the lock from the anti-creeping devices. Fig. 3. is a similar view showing the lock released and the lifter on the lock-set. Fig. 4. is a similar view showing the knuckle partly open, the lock resting on the knuckle tail, and, in full lines, the lifter in its lowermost position, while said lifter is also shown in dotted lines in the act of being kicked off the lock-set. Fig. 5. is a similar view showing the knuckle being thrown open by the lifter and opener, the dotted lines indicating the position into which the lifter and lock will drop if released. Fig. 6. is a horizontal section through the coupler-head and shank, showing the knuckle and lock in plan and the lifter in section. Fig. 7. is a sectional elevation on the line 7—7 of Fig. 6. showing the knuckle and lifter in elevation and the lock in cross-section. Fig. 8. is a section on the line 8—8 of Fig. 6. looking in the direction of the arrows. Fig. 9. is a fragmentary view showing the lock in side elevation, and showing the anti-creeping mechanism. Fig. 10. is a similar view showing a slightly modified construction of anti-creeping mechanism. Fig. 11. is a vertical section through the shank and a part of the head of the coupler. Fig. 12. is a perspective view of the lock and lifter engaged. Fig. 13. is a perspective view of the knuckle, and Fig. 14. is a plan view of the lock.

In the drawings 15 represents the coupler-head or casing, 16 the knuckle, 17 the lock and 18 the lifter, these parts being so constructed and combined with each other that the knuckle is held in the closed position by the lock, and said lock is released from the locking position by the vertical movement of the lifter and is supported on the tail of the knuckle when the latter is open, while the lifter is allowed to drop back to the normal position. The lock shown in the drawings is supported at its rear end within the shank of the coupler, its forward end being heavy and provided with a flat face to make contact with the vertical face of the knuckle tail and being supported, when in its lowermost position, by a ledge 15^f formed in one side of the drawhead, as shown in Figs. 1, 2, 7, 9 and 10. The lock is provided at its rear end with integral trunnions which may be in the form shown particularly in Figs. 9. and 12. wherein 17^a represents one of the trunnion members having a curved upper surface and terminating at its rearward side in the plane of the rear end of the body of the lock, and 17^b a second member which has a symmetrical curved portion extending beyond the rear end of

the lock body and terminating in a hook 17^c Fig. 9.

As shown in Fig. 14, the lower front ends of said trunnions are in line with each other transversely, and said trunnions are confined within seats provided, on one side, by a vertical web 15^a extending longitudinally of the coupler shank, as best seen in Fig. 11, and on the other side by an overhanging flange 15^e on the side wall of said shank. The vertical member 15^a of the overhanging flange 15^e is shaped on its rear side with a vertical lower wall 15^f, an intermediate inclined or cam surface 15^g, and an upper vertical wall 15^h, as best seen in Fig. 9, while the seat 15^b of the vertical web 15^a is similarly shaped, as seen in Fig. 11. The bottom wall of the coupler shank is provided with a ledge or shoulder 15^f, with which a rearwardly projecting hook 17^c on trunnion 17^b engages when the lock is in its normal lowermost position, as shown in Figs. 1 and 9. When the rear end of the lock 17 is raised, as shown in Fig. 2, and as hereinafter described, the hook 17^c of the trunnion 17^b will be at once disengaged from the ledge 15^f, and then the forward end of the lock may be raised, as shown in Fig. 3, but until this disengagement takes place said hook 17^c and ledge 15^f will effectually prevent any movement of said lock on its pivot, due to the fact that both the vertical web 15^a and the post 15^g will prevent rearward movement of the locking bar, and will thus act as an anti-creeping device. When initially raised to the position shown in Fig. 2, however, with the upper sides of the trunnions 17^a and 17^b in contact, respectively, with the upper wall of seat 15^b in vertical web 15^a, and the underside of overhanging flange 15^e, the rear end of lock 17 is free to turn on its pivot, the enlargement formed by inclined surface 15^g on vertical member 15^a, and the corresponding inclined surface in seat 15^b of web 15^a, affording the necessary room. During this turning or rocking movement of lock 17 the rear end 17^c of said lock will contact with a ledge or post 15^g, while undue forward movement of the lock will be prevented by the engagement of the forward edges of the trunnions 17^a and 17^b with the incline 15^g and the corresponding incline in seat 15^b of web 15^a.

As shown in the plan view Fig. 14, the lock is provided on its side opposite the locking face with a shoulder 17^d which may be used as an additional means for preventing the upward creeping of the lock by its engagement with a forwardly projecting rib or web 15^h, this shoulder underlying the extreme edge of said rib or web when the parts are in the normal locked position as shown in Fig. 1. When the rear of the lock is raised and the rotative movement begins, the axis of rotation being above the axis of the

trunnions when in the lower normal position, the movement will take place in such manner that the shoulder will clear the forward edge of the web. It is obvious that in the return movement of the lock to its normal position the contact between its rear end and the post 15^s at the rear wall of the seat pocket will permit the lock to descend to its position beneath the web and the front edge of the trunnion contacting with the cam surface 15^e will insure the reengagement of the hook 17^e of the trunnion with the ledge 15^t, thus making effective again the anti-creeping provisions.

As a further assurance against creeping it will be noted from an examination of Fig. 9. that the seat for the rear end of the lock when in normal position has a vertical wall 15^t below the cam surface 15^e, and that if the front end of the lock should begin to rise under draft the contact between the forward edge of the trunnion and such vertical wall, taken in connection with the engagement of the rear end 17^e of the lock with the rear vertical wall of the seat formed by the upstanding post 15^s, would prevent such creeping movement.

In Fig. 10. we have shown the lock provided with cylindrical trunnions, the hook being omitted, and reliance being placed, to prevent the creeping, mainly upon the contact of the shoulder 17^a on the lock with the anti-creeping flange or web 15^a of the casting. It will also be noted that the upper part of the seat for the rear end of the lock has a greater longitudinal diameter than the lower portion thereof so that when the lock is raised into said larger portion of the seat it may rotate freely therein, while when in the lowered position the vertical rear wall 17^e of the lock so locks with the post 15^s as to prevent such rotative movement.

While we have described several provisions for preventing the creeping of the lock, it will be understood that they may be used either independently or jointly.

The form of the lifter and opening piece is best shown in Fig. 12. and in the form shown is a vertical, movable member having a lateral or outstanding shoulder 18^a to engage beneath the lock, and a knuckle opening member 18^b to engage the knuckle tail. In the coupled position the shoulder 18^a may be in contact with the lower surface of the lock, and this contact is about midway of the length of the lock but rearward of its center of gravity, with the result that when the lifter is raised it first lifts and disengages the rear end of the lock from the control of the anti-creeping devices and then rotates the lock upon its bearings as described until it is free from contact with the tail of the knuckle. To insure the lifter picking up the lock in the rear of its center of gravity and thereby disengaging it from

its anti-creeping provisions, the coupler-head is provided with an opening, the forward wall 15^j of which forms a guide surface for the lifter during the initial opening movement and until the lock shall have been disengaged from its anti-creeping provisions and is in position to rotate. When the unlocking movement has proceeded until the opening member 18^b of the lifter contacts with the tail of the knuckle, if the knuckle is engaged with the knuckle of another coupler, the movement can proceed no further, but the lifter will be forced forward by reason of its cam shoulder 18^a riding on the lower inclined surface of the lock until it is in the lock-set position (see Fig. 3.). Now, if the knuckle be opened the lifter will be driven off the lock-set by the contact of the rib 16^b on the tail of the knuckle with the curved bulged portion 18^c of the lifter and the latter will drop to its original position as shown by the full lines in Fig. 4., the lock remaining supported on the tail of the knuckle.

The lifter has rather deep depressions 18^d and 18^e, respectively, above and below the bulged projections 18^c, the former permitting the knuckle to close when the lifter is down without striking the lifter and the latter permitting the tail of the knuckle to pass through in the opening movement, the opening member 18^b acting as a cam on the lower inclined surface of the knuckle tail during the major part of the movement, while the final opening impetus is given to the knuckle when the lifter contacts with the rear wall of the opening in the top of the coupler-head, as shown in Fig. 5., which acts as a fulcrum to throw the lower end of the lifter forward, the knuckle tail resting then in the deepest part of the depression 18^e.

In order to facilitate the freeing of the knuckle in the event of the pulling out of the coupler due to the failure of the draft connection, the rear side of the lifter at the point of contact with the wall of the coupler and for some distance below said point is cut away to provide a downwardly and forwardly inclined cam surface 18^f which will engage the wall of the coupler under the pull of the lifting chain thus increasing the leverage of, and reducing the friction on, the lifter and thus assisting in raising the lock to free the knuckle. The anticreeping features being independent of the draft, the only friction to be overcome in this exigency is that due to the turning of the parts on their bearing surfaces. The side of the knuckle is flattened as shown at 16^a to provide space between it and the lock to receive the lifter.

It will be noted that the rear end of the lock is held or supported in its raised position by the contact of its rear end 17^e and its trunnions with the walls of its pocket or

seat, the cam ledge 15^c and the similar ledge in the seat 15^b of the web 15^a cooperating with the trunnions and rear end of the lock and the upstanding post to support the lock in its raised position the front end of the lock being supported as already described. Instead of the lock being supported by the trunnions on the cam ledges, these ledges may be omitted, as shown in Fig. 10, and the upper portion of the retaining walls enlarged to permit rotating the lock so that when the lock is raised the vertical rear wall 17^c will turn into contact with the post 15^g, which will support the lock in a raised position. While we have shown the rear end of the lock contacting with and having an eccentric or cam contact with the upstanding post 15^g, it is obvious that this eccentric rocking may take place between the trunnions themselves and the guide ribs only and the upstanding post may be omitted.

In assembling the parts, the lifter is first put in place. The lock may then be inserted by turning it so that the trunnions extend in a vertical plane with their curved surfaces toward the lifter and with the trunnion 17^b upward, and then by giving it a quarter turn it will drop down into its proper position, the hook 17^c engaging over the ledge 18^f and the forward end of the lock resting on the bottom wall of the coupler above the lock-set, or the lock may be first inserted and the lifter dropped down to a position as in throwing the knuckle, when if the lock be raised the lateral shoulder 18^a may be swung under the lock and the parts will fall to their natural position. The knuckle then being inserted and the pivot pin put in place, it is obvious that the lock will always be held in its proper position by its contact with the inner side of the knuckle when the latter is closed and by the lifter when the knuckle is open and the lock is in the raised position resting on the tail of the knuckle. Heretofore locks operating on trunnions have not been securely retained in their seat and are liable to displacement while the couplers are being handled in shipment. In our improved construction the lock is retained securely in its seat, without the use of extra parts.

The operation of our improved coupler will be obvious from the foregoing description taken in connection with the illustrations of the various positions shown in the drawings. It is also obvious that the principles of our invention are capable of embodiment in other structural forms, which may be made consonant with the principles of our invention which include broadly such a combination of knuckle, lock and lifter as will enable the lock to be lifted and the lifter to return to its normal unexposed position, and such anti-creeping provisions as will effectually prevent creeping of the lock un-

der draft in combination with means for freeing the lock from engagement with said anti-creeping provisions and then free the same from the knuckle.

Structurally our invention comprises, broadly stated, a lock having a shifting pivot and normally incapable of rotation until such pivot is shifted to a new position, in combination with means for holding the lock in normal position and for shifting it to a new position and then rotating it on its pivot to free the knuckle. Also our improvements comprise, broadly stated, a lifter of such construction that it shall serve to shift the lock pivot, to rotate the lock on its pivot and to return to its normal position leaving the lock elevated but preventing it from becoming displaced while riding on the tail of the knuckle. These functions require that the lock and lifter shall be separate and that the engagement between them shall be broken when the lifter has performed its primary function. Another structural characteristic of our invention is that the lifter, while capable of being sustained on the lock-set, is disengaged therefrom upon the opening of the knuckle and by engagement therewith of the knuckle tail and shall be returned to its normal position by gravity, thus insuring the return of the lifter out of harm's way when the knuckle is open and providing against any possible contact therewith of the knuckle or other parts in coupling or when the cars are thrown together. Our invention also affords a coupler in which the lock is easily manipulated, because the initial movement of the lifter is opposed only by the weight of the rear end of the lock while the lifting of the front and heavier end of the lock is accomplished by a rocking movement which is facilitated by the sliding action of the lifter on the lock. The form of the lifter also affords an effective leverage in opening the knuckle, the lock holding the lifter forward with its cam projection in contact with the knuckle tail during the initial opening movement, while the final throw of the knuckle is accomplished by the tilting movement of the lifter, and finally the lifter is so fashioned as to facilitate the freeing of the lock to open the knuckle in case of accidental breakage of the draft rigging, thus preventing the coupler being pulled out and dropping on the track.

We claim:

1. In a car coupler, the combination with a pivoted knuckle, of a lock adapted to be supported by the knuckle when opened, and a lifter for the lock, said lifter being normally substantially unexposed and adapted to extend through an opening in the wall of the coupler when lifting the lock and to drop back into normal position when the knuckle is opened.

2. In a car coupler, the combination with

a pivoted knuckle, of a lock adapted to be supported by the knuckle when the latter is open, and a combined lock lifter, knuckle opener and lock set adapted to drop to its lowermost position when the knuckle is open.

3. In a car coupler, the combination with a pivoted knuckle, and a one piece lock therefor, of means on said lock for preventing creeping movement of said lock in any direction toward which the draft on said knuckle may tend to force said lock, and means for first withdrawing said lock from said anti-creeping provisions and then moving the same to the unlocking position.

4. In a car coupler, the combination with a knuckle oscillating upon a fixed axis, of a lock therefor having a floating pivot, and means for lifting said lock to the unlocking position said means operating to first shift the pivot of said lock and to then lift it to release the knuckle.

5. In a car coupler, the combination of a pivoted knuckle, a lock therefor having a floating pivot, means for preventing the creeping movement of said lock under draft, and means for initially shifting said pivot to free said lock from its anti-creeping provisions and then raising said lock to its unlocking position.

6. In a car coupler, the combination with a knuckle oscillating upon a fixed axis, of a lock therefor having a floating pivot, means applied to the rear end of the lock for preventing the creeping movement thereof under draft, and means for lifting the lock said means being operated to first free the rear end of the lock from its anti-creeping provisions and then to lift it to release the knuckle.

7. In a car coupler, the combination with a pivoted knuckle, of a lock therefor, said lock being normally held against creeping movement due to the draft, and a lifter adapted to be operated first to release the lock from its anti-creeping provisions and then to move the same to release the knuckle, said lock being adapted to rest upon and be supported by the tail of the knuckle when open, and the lifter being adapted to return to its normal unexposed position when the knuckle is opened, substantially as described.

8. In a car coupler, the combination with a pivoted knuckle, of a lock arranged wholly within the coupler casing with its front end adapted to contact the knuckle and prevent its opening and its rear end engaging projections on the casing to prevent its rotation, and a lifter reciprocable through an opening in the top wall of the coupler and adapted when raised to first free the lock from the anti-creeping provisions, then move the same to release the knuckle and finally to drop back to normal, unexposed position

leaving the lock supported on the tail of the knuckle.

9. In a car coupler, a knuckle lock having a pivot vertically movable to operative position.

10. In a car coupler, a pivoted knuckle lock, a seat for said pivot shaped to permit said pivot to shift therein, and lifting means for said lock adapted to initially shift said pivot in its seat.

11. In a car coupler, a knuckle lock having a floating pivot, and anti-creeping provisions applied to said lock at its pivotal end.

12. In a car coupler, a knuckle lock having a floating pivot and an eccentric rocking movement thereon and an anti-creeping provision forward of its pivot.

13. In a car coupler, a knuckle lock, a seat for the rear end of said lock, and means for supporting the rear end of the lock above its seat when out of locking position.

14. In a car coupler, a lock lifter having its front edge provided with a bulged portion to contact the tail of the knuckle and a depression above said bulge to permit the knuckle to open and close when the lifter is in the normal position.

15. In a car coupler, a lock lifter normally disengaged from the lock and having its front face forwardly bulged for contact with the tail of the knuckle, and having a depression above said bulge to permit the return of the knuckle when the lifter is lowered, and a depression below said bulge whose wall contacts with the tail of the knuckle in the final opening movement.

16. In a car coupler, a knuckle having a flattened portion in the rear of the locking face of the knuckle to receive the lifter, and having a cam rib beyond said flattened portion.

17. In a car coupler, the combination with the body portion thereof, and a pivoted knuckle therein, of a pivoted lock therefor, a separate lifter for said lock, and means forming part of the pivot of said body portion for engaging said lock to prevent the removal thereof while said knuckle and lifter are in position.

18. In a car coupler, the combination with the body portion thereof, and a pivoted knuckle therein, of a lock having trunnions therefor, a separate lifter for said lock, and means forming part of said body portion engaging said trunnions to retain the latter in operative position while said knuckle and lifter are in position.

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