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PIN RETAINING MEANS

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2 Sheets-Sheet 1

Fig. 1

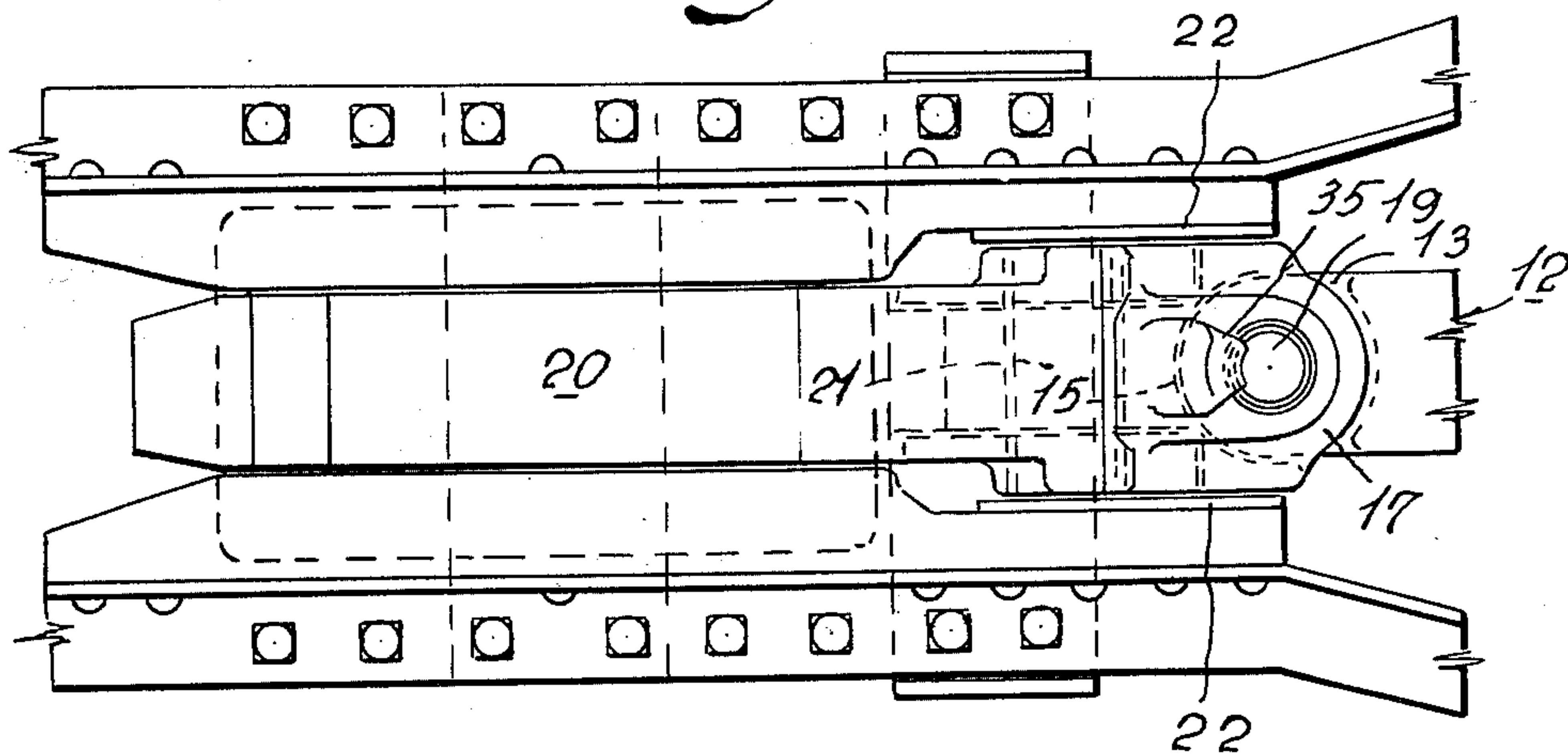
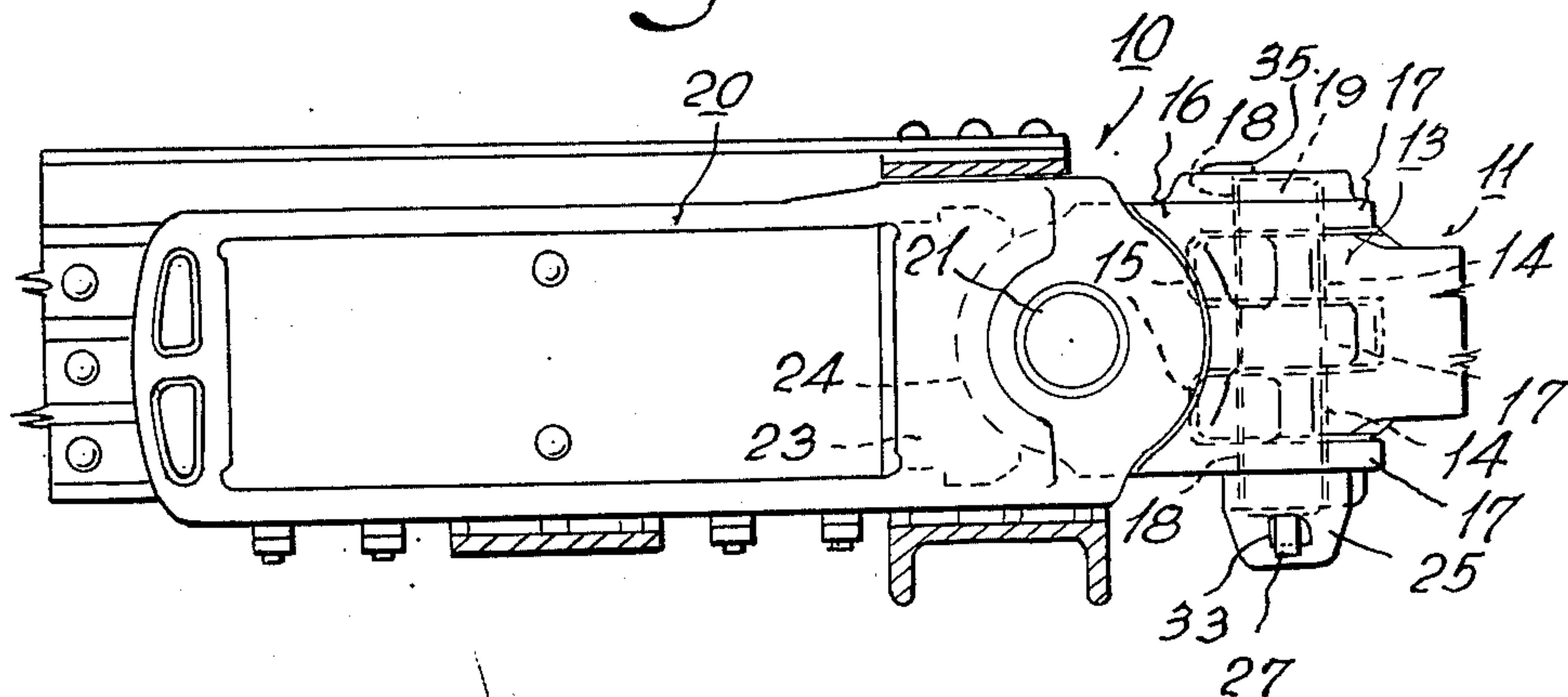


Fig. 2



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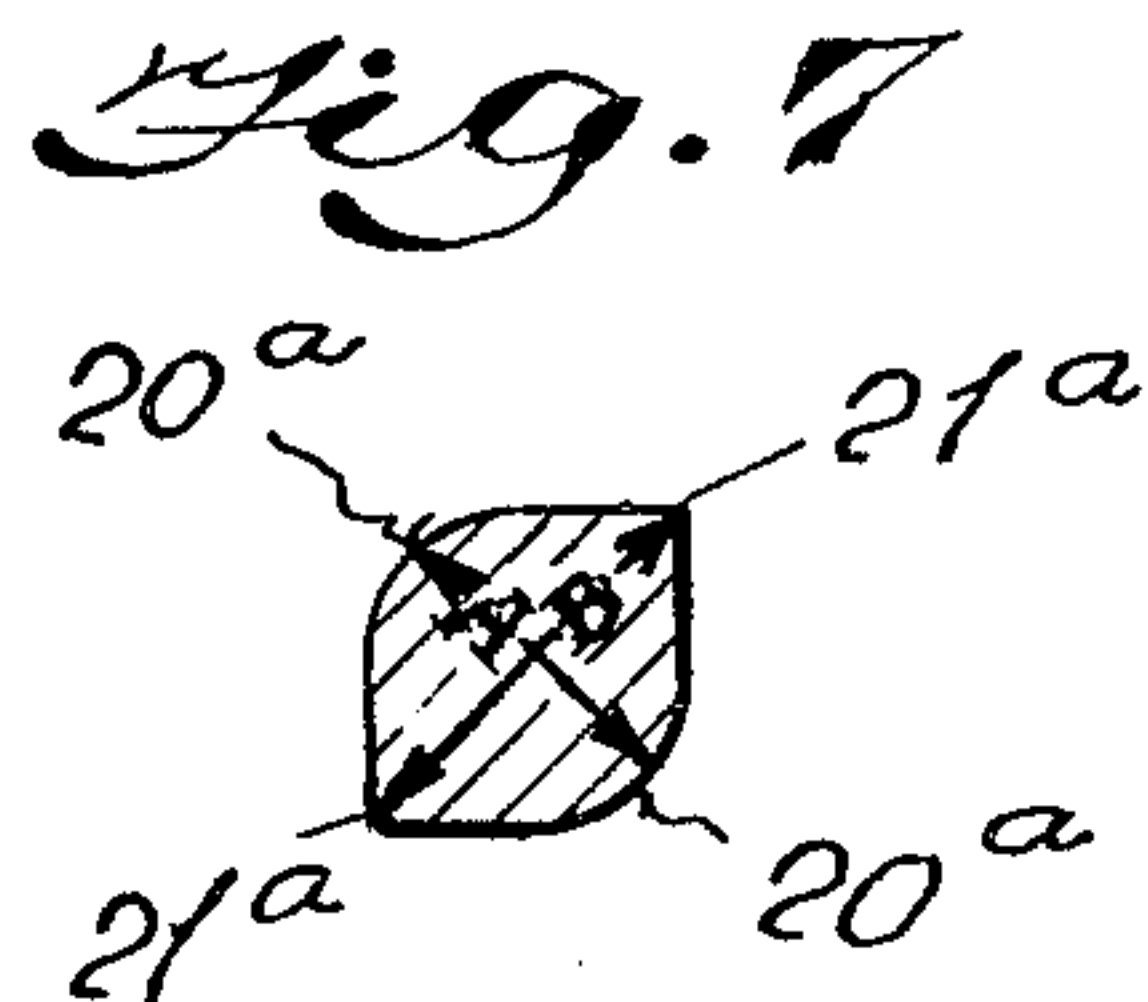
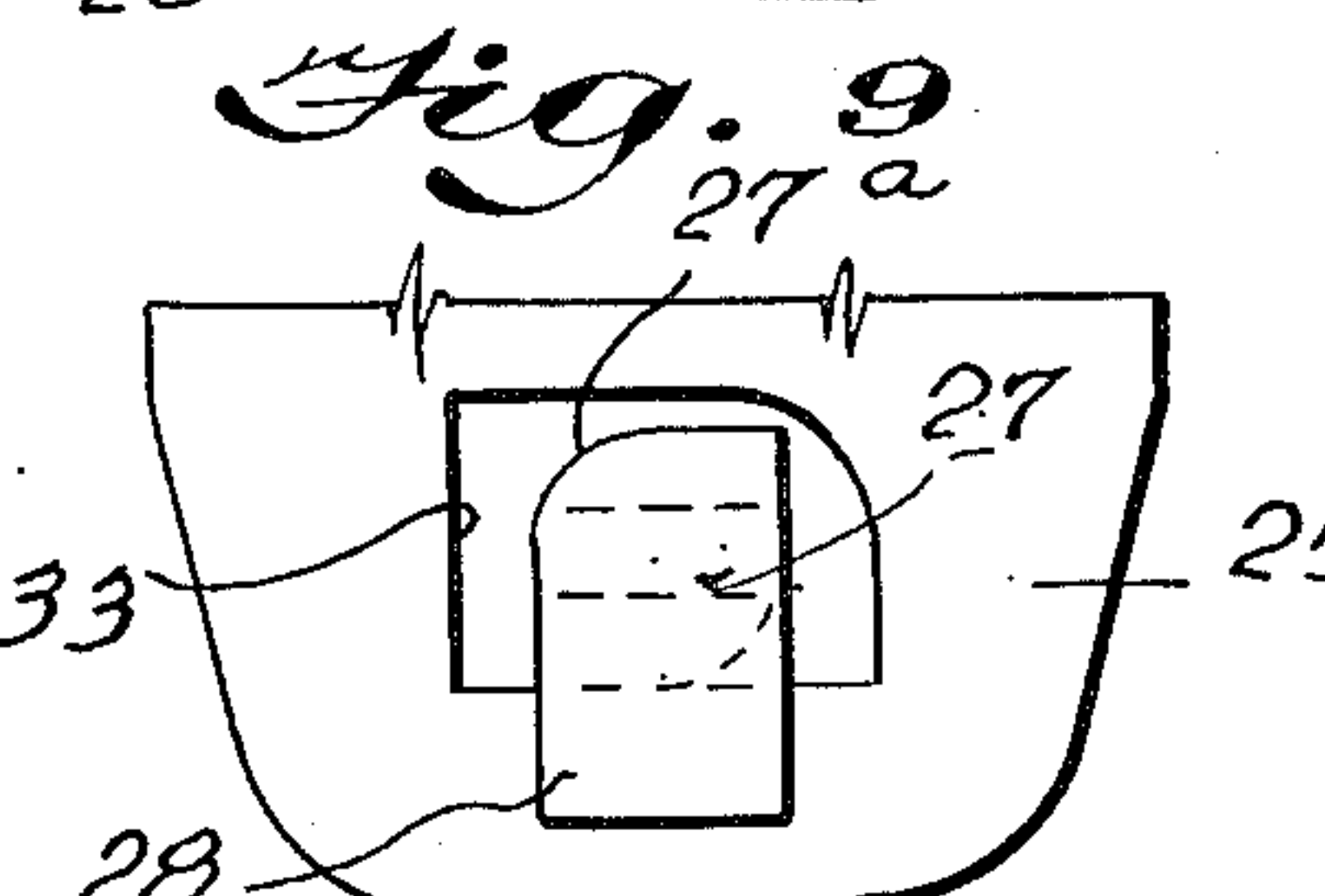
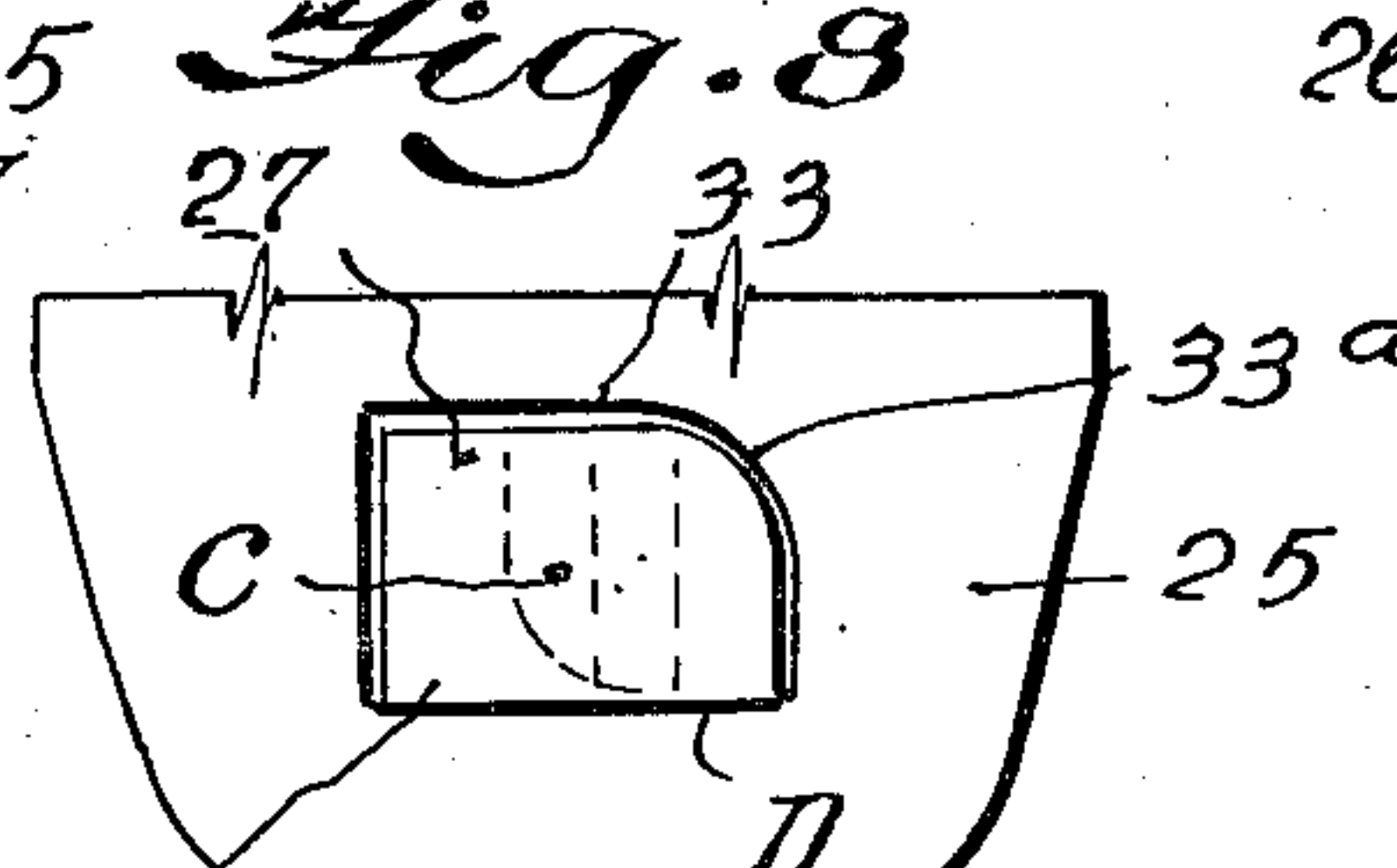
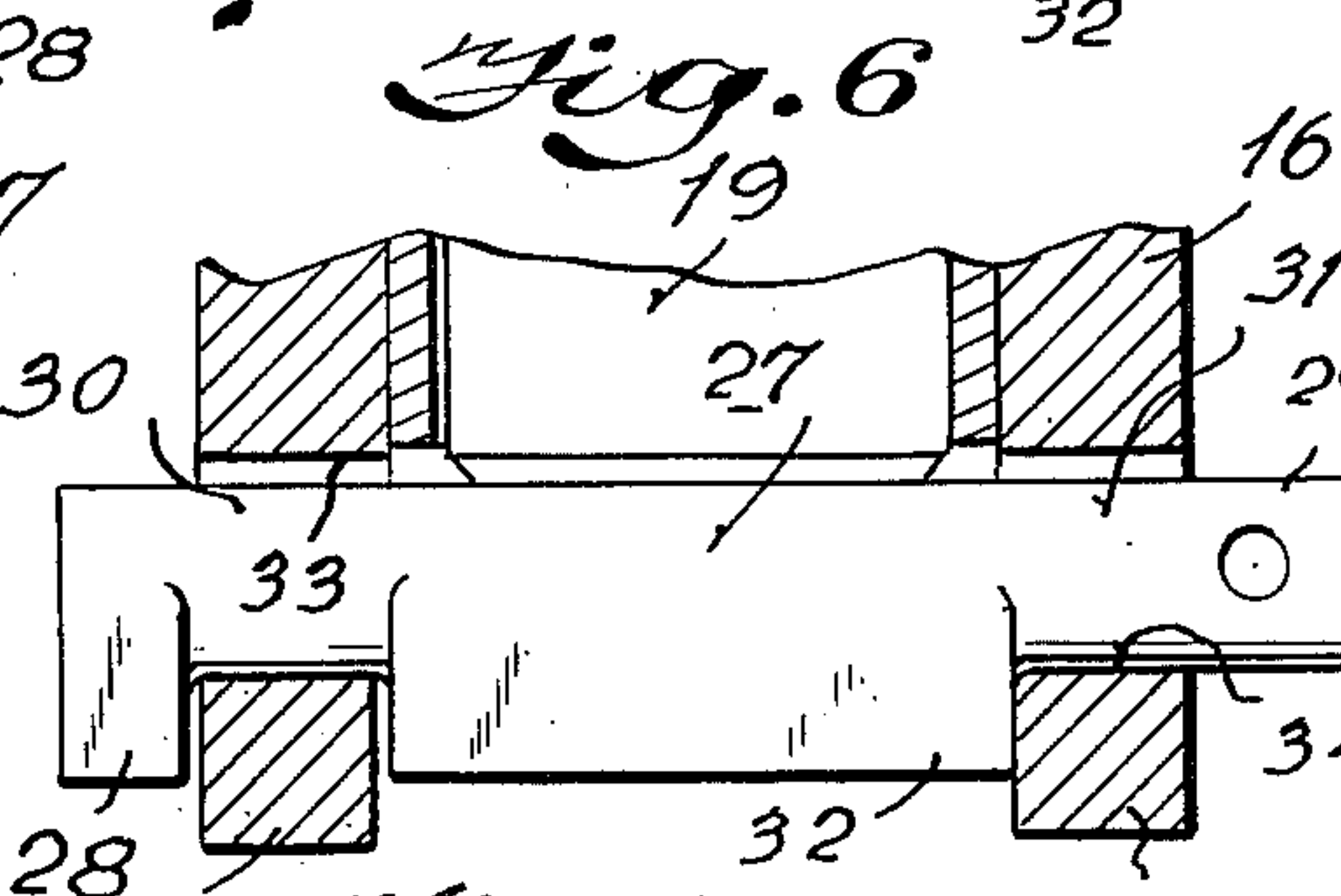
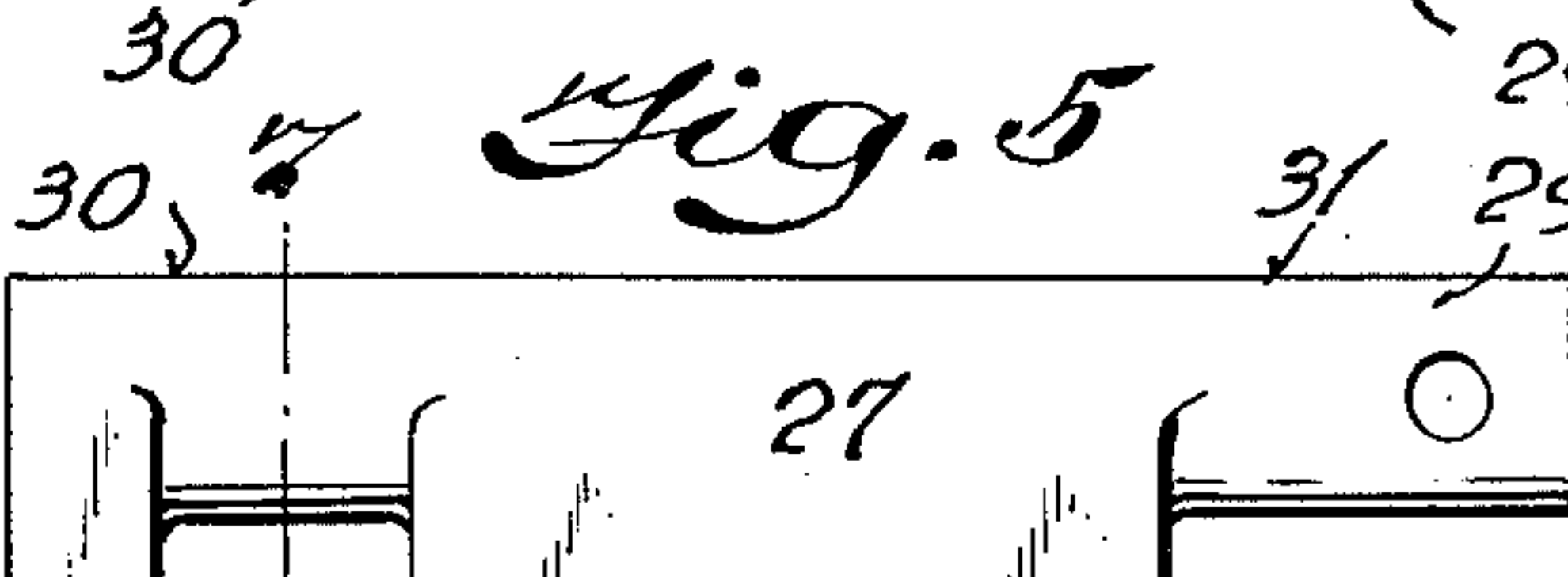
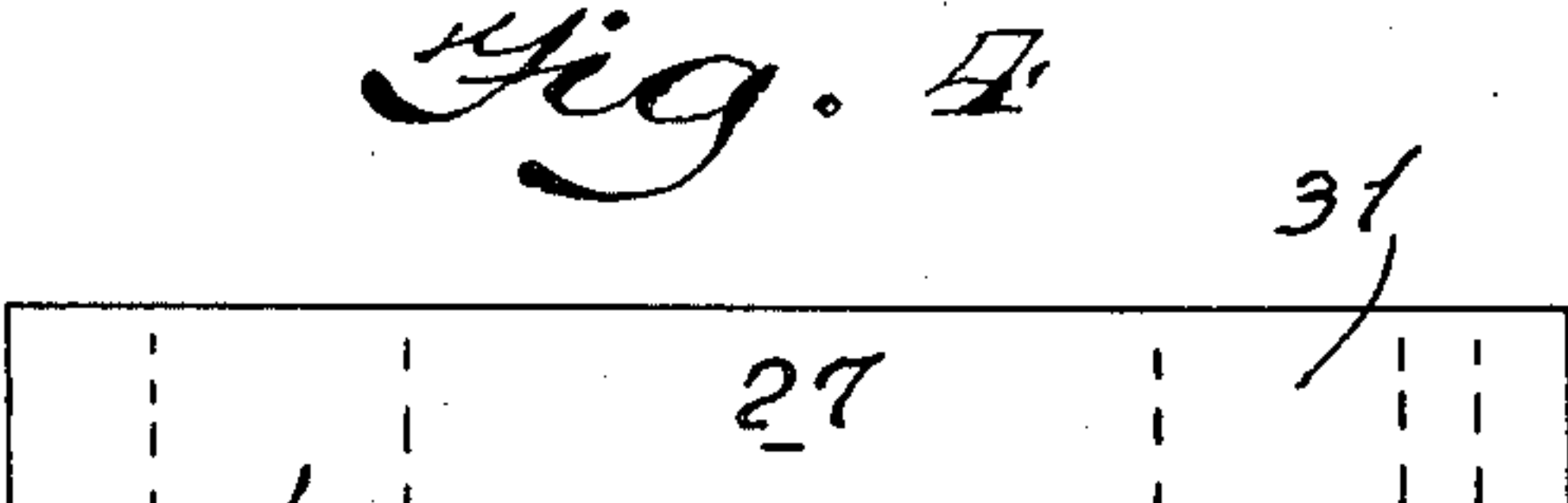
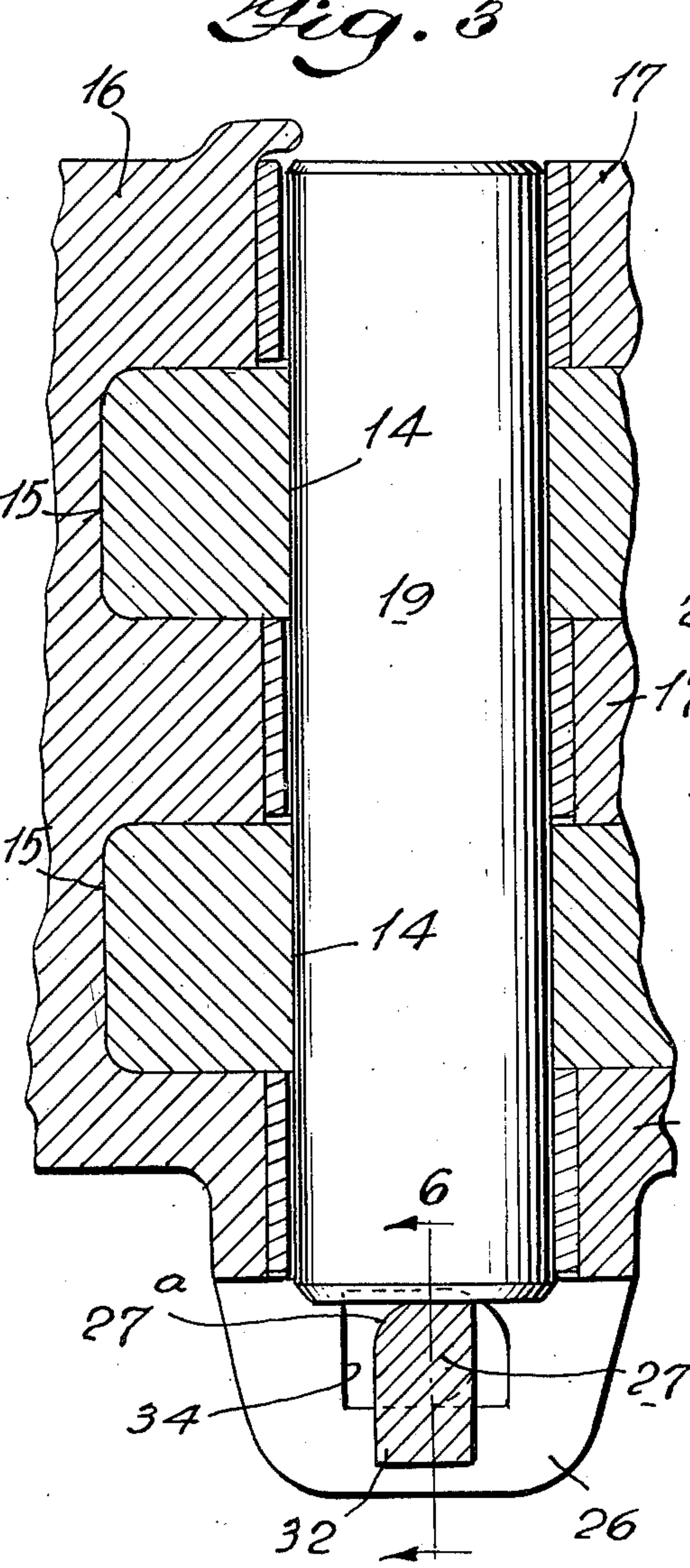
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PIN RETAINING MEANS

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PIN RETAINING MEANS

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10 Claims. (Cl. 213—72)

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This invention relates to pin retaining means and more particularly to means for retaining the coupler shank pin in proper association with a railway draft mechanism.

Some of the objects of the invention are to provide a simple efficient means of retaining a vertical pin or key in position connecting a coupler to the other parts of a draft rigging; to eliminate any possibility of the retainer being improperly applied; to provide a structure in which gravity tends to keep the retainer in locked position; and to supply a retainer that can be applied with a minimum lift of the pin consistent with proper pin bearing and clearances.

With the foregoing objects outlined and with other objects in view which will appear as the description proceeds, the invention consists in the novel features hereinafter described in detail, illustrated in the accompanying drawings and more particularly pointed out in the appended claims.

In the drawings:

Fig. 1 is a top plan view of a portion of a railway draft structure of the type with which my retainer may be used.

Fig. 2 is a vertical sectional view of the same.

Fig. 3 is an enlarged vertical sectional view of a detail illustrating the coupler shank pin and my improved retaining means.

Fig. 4 is a plan view of the retainer key.

Fig. 5 is a side elevation of the same.

Fig. 6 is a vertical sectional view on the line 6—6 of Fig. 3.

Fig. 7 is a transverse vertical sectional view of the key taken on the line 7—7 of Fig. 5.

Fig. 8 is a side elevation of one of the apertured lugs to receive the key and showing the key in insertion or removal position.

Fig. 9 is a similar view with the key in pin retaining position.

Referring to the drawings, 10 designates railway draft means including a coupler 11 (only a portion of which is shown) which has a shank 12, bifurcated at the butt end 13 and provided with vertical pin holes 14. The coupler butt fits into pockets 15 in the radial connection 16. Lugs 17 on the radial connection 16 have pin holes 18 to receive the vertical pin 19 which connects the coupler to the radial connection. The radial connection is pivotally secured to a yoke 20 by a horizontal pin 21 retained by draft lugs 22 which are part of the center sill arrangement of the railway car. The radial connection seat 23 bears against the rear surface 24 of radial connection 16 and the draft gear (not shown) in buff. The

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radial connection seat 23 performs no function in pulling.

In accordance with the present invention, the radial connection casting 16 has depending pin support lugs 25 and 26 which support the retainer key 27 and in turn the vertical pin 19. Retainer 27 has a head 28 and an extension 29 which is drilled for a rivet or cotter, not shown. The portions 30 and 31 of the retainer which rest on the support lugs 25 and 26 are shaped as shown in Fig. 7. A section through the portions or journal areas 30 and 31 shows that the corners 20a are rounded so as to permit the retainer to be turned 90° without having to raise the pin 19 an appreciable amount, and the other two opposite corners 21a are made square with small radii on these corners. The intermediate portion 32 of the retainer has a cross sectional shape like the head 28 which prevents removal of the latter except by turning it through approximately 90° in a clockwise direction in Fig. 3. The retainer head 28 and intermediate portion 32 are approximately rectangular in cross section with one corner of the head 28 and the portion 32 each arcuate shaped at 27a, and this rounded portion preferably extends from end to end of the retainer.

Support lug 25 has a slot 33 through which retainer 27 is inserted, as shown in Fig. 6, and the height of the slot is slightly more than the diagonal A and considerably less than the diagonal B (Fig. 7) of the key which permits the retainer to rotate 90°, more or less, in one direction only.

The length of the slot 33 is slightly longer than the depth of the retainer to permit application. Slot 33 has three square corners and one rounded corner 33a which permits the retainer to be inserted in only one position. If the retainer could be inserted in the opposite position (locking lugs to the front), the retainer could not be turned with lugs 28 and 32 down, and consequently the retainer could not be properly applied, or time would be wasted in removing and re-applying the retainer.

Slot 34 in support lug 26 is made approximately the same height as slot 33 for the same reasons as given for that slot. However, the length of the slot 34 is made less than the depth of the retainer at the center portion 32 to prevent application of the retainer from the side on which the lug 26 is placed. The length of slot 34 must be long enough to permit diagonal B on the retainer to pass when the retainer is rotated 90° during application.

Further, when the retainer is applied, its

center of gravity C (Fig. 8) is outside the point of support D and the retainer will rotate due to gravity so that the head 28 and intermediate portion 32 of the retainer 27 will interlock with lugs 25 and 26 on the radial connection casting 16. This tendency to rotate, due to gravity, also serves to keep the key from rotating into an unlocked position.

From the foregoing, it will be noted that in order to lose the pin 19, the cotter or rivet must be lost, the pin must rise, the retainer 27 must turn approximately 90° and slip sideways, which is a very remote possibility. Clearances are usually located between the top of radial casting 16 and the top of cover plate (not shown) of the draft sills. It is, therefore, desirable to limit the height of the lug 35 at the top of the radial connection, which lug limits upward movement of the pin 19.

When retainer 27 is rotated counter-clockwise, after it is inserted, pin 19 must rise to permit diagonal A to pass between the bottom of slots 33 and 34, and the bottom of pin 19. If diagonal A were made longer, pin 19 would have to be elevated, for it would interfere with the height of lug 35. Lug 35 would then have to be raised to clear the pin, which is not desirable. The depth of slots 33 and 34 would also have to be increased by raising the tops of slots to provide clearance to rotate the retainer.

The other alternative (if diagonal A were made longer) would be to leave lug 35 as shown and increase the depth of slots 33 and 34 by lowering the bottom thereof to provide the necessary clearance for rotation of retainer 27. Then, when pin 19 is resting on retainer 27 in the applied position, the pin would be lower than both, and the bearing area between the pin and top lug 17 on the casting 16, would be reduced, which is also undesirable.

Therefore, diagonal A should be more than the width or thickness of the retainer 27, at 30 and 31, and considerably less than diagonal B in order to maintain proper bearing areas and clearances. From the drawings, it is apparent that applicant's construction embodies these desirable features.

Modifications can, of course, be made in the retainer illustrated without changing the effectiveness of its function. Both ends of the retainer could be made with lugs like head 28, or both ends could be made like end 29, or both ends could have lugs like 28 and cotter holes, if desired. The modifications may vary the shape of the slots 33 and 34 slightly.

While the invention disclosed was designed for use with the present A. A. R. Standard tight-lock coupler, yoke and radial connection, it is not limited to use with such an arrangement, as there are numerous coupler applications using a vertical pin which requires an efficient pin retaining means.

From the foregoing, it is believed the construction, use and advantages of the invention may be readily understood, and it is apparent that other changes may be made in the details disclosed without departing from the spirit of the invention, as expressed in the following claims.

What I claim and desire to secure by Letters Patent is:

1. In means for retaining a vertical pin connector of railway draft mechanism in which opposed depending lugs are provided with bearing slots for the reception of a horizontal retaining key that supports the pin, the improvement in which the retaining key extends through the

slots and has an intermediate portion arranged between the lugs, said intermediate portion having a part projecting radially from the key and oppositely disposed flat surfaces, a third plane surface merging into said flat surfaces at one side of the key, and a partially plane and partially arcuate surface merging into the flat surfaces at the opposite side of the key, one of said slots being of substantially the same size and cross-sectional shape as the intermediate portion of the key whereby the key can be inserted in the slots in only one position.

2. Retaining means as claimed in claim 1, in which the key is provided between said intermediate portion and its ends with bearing portions each of substantially oval shape in cross-section with diametrically opposite arcuate portions and also with diametrically opposite wedge-shaped edge portions whereby the key when in retaining position can turn about its axis in one direction only to a position where the key can be withdrawn from the slots.

3. In a railway draft appliance having a vertically disposed coupling pin, a pair of spaced lugs depending from said draft appliance at opposite sides of said coupling pin, said lugs having slots therein in substantially horizontal alignment, a retaining key arranged transversely across the lower end of the coupling pin and supported in said slots, a head portion at one end of the retaining key generally rectangular shaped in cross section, an arcuate surface at one corner of the head, an intermediate portion on the retaining key between the lugs substantially rectangular in shape in cross section and aligned with the head, an arcuate surface at one corner of the intermediate portion aligned with the arcuate surface on the head, journal areas at the ends of the intermediate portion and located within said slots, and said journal areas in cross section being generally square with a pair of opposite corners arcuate shaped.

4. In a railway draft gear having a vertically disposed coupling pin, a pair of spaced lugs depending from said draft gear at opposite sides of said coupling pin, said lugs having slots therein arranged in substantially horizontal alignment, a retaining key arranged transversely across the lower end of the coupling pin, journal areas on said pin within said slots for supporting the retaining key, an intermediate portion on the retainer key between the lugs projecting laterally beyond the journal areas displacing the center of gravity of the retainer key laterally of the axis of the journal areas, said intermediate portion being substantially rectangular shaped in cross section, an arcuate corner on the rectangular portion, one of said slots being rectangular shaped in cross section disposed with the longer dimension in a generally horizontal position, an arcuate surface at a corner of said rectangular slot shaped in accordance with the arcuate corner on the retainer key, the journal area in the rectangular slot being substantially square shaped in cross section with one diagonal thereof of greater dimensions than the height of said rectangular shaped slot, and the opposite corners of said square shaped journal area being rounded off to provide another diagonal of smaller dimensions than the vertical height of said rectangular shaped slot.

5. In a railway draft gear having a vertically arranged coupling pin, a pair of spaced lugs depending from said draft gear at opposite sides of said coupling pin, said lugs having slots there-

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in in substantially horizontal alignment, a retaining key disposed transversely of the lower end of said coupling pin and supported in said slots, spaced journal areas on said key, a head lug on the retaining key at the outer end of one journal area projecting radially beyond the journal area displacing the center of gravity of the retaining key laterally of this axis of the journal area, a lug on the retaining key having an edge adjacent the other end of the same journal area extending radially beyond the journal area substantially in the same direction as the head lug and further displacing the center of gravity from the axis of the journal areas, the slot in one of said lugs having such dimensions measured horizontally as to permit the intermediate lug to pass axially through said slot, and a flat surface on said retaining key diametrically opposite said intermediate lug adapted to be engaged by the lower end of said coupling pin.

6. In a railway draft gear having a vertically arranged coupling pin, a pair of spaced lugs depending from said draft gear at opposite sides of said coupling pin, said lugs having slots therein in substantially horizontal alignment, a retaining key disposed transversely of the lower end of said coupling pin and supported in said slots, spaced journal areas on said key, a head lug on the retaining key at the outer end of one journal area projecting radially beyond the journal area displacing the center of gravity of the retaining key laterally of the axis of the journal areas, a lug on the retaining key intermediate the journal areas having an edge adjacent one lug and extending radially beyond the journal areas substantially in the same direction as the head lug and further displacing the center of gravity from the axis of the journal areas, the slot in one of said lugs having such dimensions measured horizontally as to permit the intermediate lug to pass axially through said slot, a flat surface on said retaining key diametrically opposite the intermediate lug adapted to be engaged by the lower end of said coupling pin, and said retaining key having a cotter pin receiving opening in the end opposite the head.

7. In a railway draft appliance having a vertically disposed coupling pin, a pair of spaced lugs depending from said draft appliance at opposite sides of said coupling pin, said lugs having slots therein substantially in horizontal alignment, a retaining key arranged transversely of the lower end of the coupling pin and supported in said slots, spaced generally aligned journal areas on said key for turning in said slots, a lateral projection on the key intermediate the bearing journal areas displacing the center of gravity of the retaining key laterally of the axis of the bearing journals, the slot in one of said lugs having such a shape measured horizontally as to permit the intermediate portion of the retaining key to be moved axially through said slot when the intermediate projection is arranged approximately at three or nine o'clock position relative to said slots whereby the retaining key rotates about its axis in response to gravity force acting on the displaced center of gravity to turn the retaining key to a position preventing axial movement through the slots, a flat surface on the intermediate portion of the retaining key diametrically opposite the lateral projection adapted to be engaged by the lower end of the coupling pin, and a head portion on the key at one end of one journal area projecting radially

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therefrom in the same general direction as the intermediate projection.

8. A retaining device for the coupler pin of a railway draft appliance comprising, a retaining key, a head portion at one end of the retaining key generally rectangular shaped in cross section, an arcuate surface at one corner of the head, an intermediate portion on the retaining key aligned with the head and of the same general rectangular shape in cross section as said head, an arcuate corner on the intermediate portion aligned with the arcuate surface on the head, a journal area at each end of the intermediate portion, the axis of said journal areas being displaced from the geometrical center of the intermediate portion and the head whereby the center of gravity of said pin is displaced from the axis of said journal areas, and said journal areas in cross section being generally square with a pair of opposite corners arcuate shaped.

9. A retaining device for the vertically disposed coupler pin of a railway draft appliance comprising, an elongated retaining key, a head portion at one end of the retaining key generally rectangular shaped in cross section, an arcuate corner on the head, an intermediate portion on the retaining key of the same general rectangular shape in cross section as said head aligned with the head, an arcuate corner on the intermediate portion aligned with the arcuate corner on the head, a journal area at each end of the intermediate portion with the axis of the journal areas displaced from the geometrical center of the intermediate portion whereby the center of gravity of said key is displaced from the axis of said journal areas, and a cam surface on one of said journal areas.

10. A retaining member for a vertical arranged coupling pin of a railway draft gear comprising, an elongated retaining key, two spaced and axially aligned journal areas on said key, a head lug including a portion projecting radially beyond the journal areas, a lug intermediate the journal areas projecting radially in the same general radial direction as said head lug whereby the center of gravity of the key is displaced from the axis of said journal areas, and a flat straight surface on the key intermediate the journal areas diametrically opposite said intermediate lug and arranged with the flat surface in a plane substantially at right angles to the radial direction of the intermediate lug.

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