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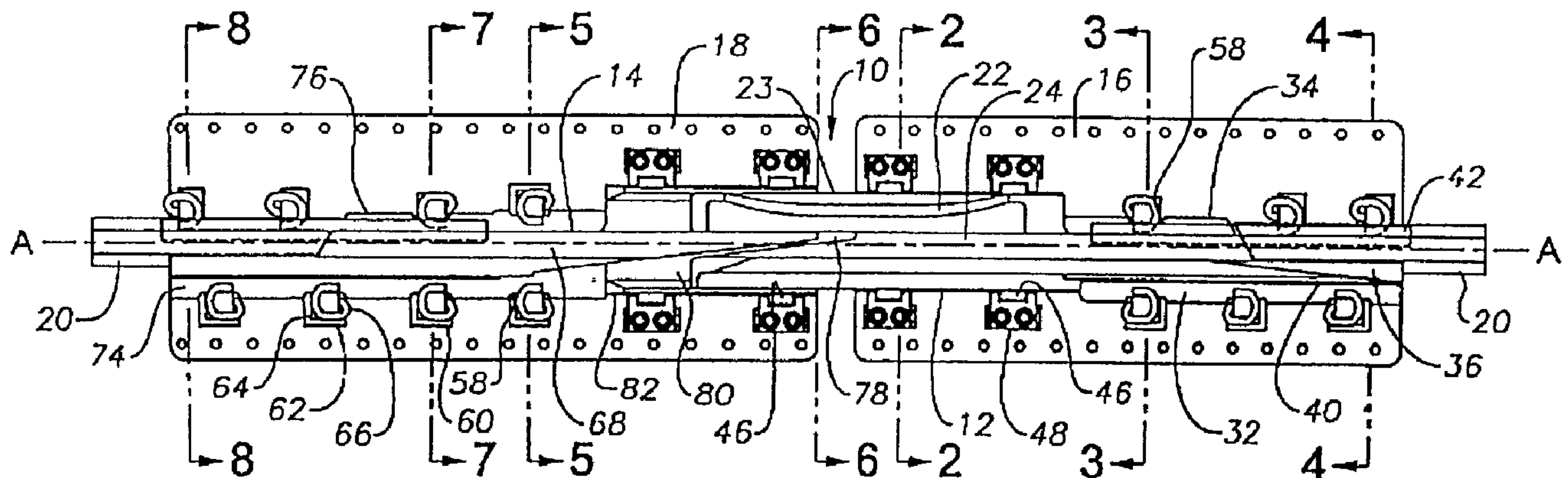
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(54) Titre : JOINT POUR RAIL DE CHEMIN DE FER

(54) Title: BRIDGE JOINT



(57) Abrégé/Abstract:

A bridge joint for use with a railroad track having standard rail sections with flanges. The bridge joint includes a fixed point having a forward integral accepting portion with a point and flanges rearward of the accepting portion. The joint also has a moveable body having a forward interface portion adapted to be slidably accepted in the accepting portion. The moveable body has a notch adapted to accept the point. Clamping lugs are positioned on the accepting portion and the interface portion. The fixed point and the moveable body are clamped to base plates and quick release fasteners are positioned to engage the flanges of the fixed point, moveable body, and a flange of each of the standard rail sections and secure all to the base plates.

1 **Abstract of the Disclosure**

2 A bridge joint for use with a railroad track having standard rail sections with
3 flanges. The bridge joint includes a fixed point having a forward integral accepting
4 portion with a point and flanges rearward of the accepting portion. The joint also has a
5 moveable body having a forward interface portion adapted to be slidingly accepted in the
6 accepting portion. The moveable body has a notch adapted to accept the point.
7 Clamping lugs are positioned on the accepting portion and the interface portion. The
8 fixed point and the moveable body are clamped to base plates and quick release fasteners
9 are positioned to engage the flanges of the fixed point, moveable body, and a flange of
10 each of the standard rail sections and secure all to the base plates.

BRIDGE JOINT

Technical Field

This invention relates to a bridge joint. More specifically, this invention relates to a bridge joint having cast members which can be easily removed and replaced.

Background Art

Bridge joints are commonly used along a railroad track to allow a bridge structure to raise and lower. Bridge joints of the prior art have included a body section and point section that maintain a substantially continuous surface on which the rail car rides. These sections are joined to the support substrate with planar base plates which are usually bolted to the support substrate and many times are integral to the sections. As the sections wear from rail car traffic they must periodically be removed and replaced. To remove such integral sections, the base plates must also be removed, which is a time consuming, costly process.

Other prior art bridge joints have sections that are bolted to the base plates. However, because these designs incorporate bolts that pass through the base plates, access to the underside of the base plates is required to remove the cast sections. If access is unavailable, the base plates must be removed with the rail sections before the sections can be removed from the base plates.

Thus, there is a need for a bridge joint having cast sections that can be easily and inexpensively replaced without requiring removal of the base plates.

Summary of the Invention

The present invention is directed to a bridge joint having a cast section that can be removed from the base plates and replaced without access to the underside of the base plates or bridge structure. The bridge joint has a first and second planar base plates. A point section is on the first base plate and has a forward integral accepting portion with

1 a point and flanges rearward of the accepting portion. A body section on the second base
2 plate has a forward interface portion adapted to be slidingly accepted in the accepting
3 portion. Body section has a notch adapted to accept the point and flanges rearward of the
4 interface portion. A plurality of fasteners are secured to the base plates for engaging the
5 flanges and securing the point section to the first base plate and the body section to the
6 second base plate. The fasteners are operated from an upper side. The fasteners have a
7 spring clips for engaging the flanges. The quick release fasteners have a base and the
8 flanges have notches adapted to engage the base.

9 A plurality of clamping lugs are position on the point section and the body
10 section. A plurality of clamps correspond to the clamping lugs. The clamps have
11 clamping members adapted to engage and restrain vertical and horizontal movement of
12 the clamping lugs and are releasable secured to the base plates. There are clamping lugs
13 on the accepting portion. There are clamping lugs on the interface portion.

14 The point section has a rearward standard rail mating portion adapted to laterally
15 abut and join with one of the standard rail sections. The body section has a rearward
16 standard rail mating portion adapted to laterally abut and join with one of the standard
17 rail section. The standard rail section has a flange opposed to the mating section which
18 is secured to the base plate with the quick release fasteners.

19 The forward accepting portion has spaced side walls positioned closely adjacent
20 to the interface portion.

21 The present invention is also directed to a method of allowing for movement of
22 a railway bridge. The railway has standard rail sections with flanges. A point section is
23 provided having an accepting portion, a standard rail mating portion, and flanges. A
24 body section is provided having an interface portion, a standard rail mating portion, and
25 flanges. A first and second base plates are provided with clamps and quick release
26 fasteners thereon. The interface portion is placed in the accepting portion. One standard
27 rail section is secured to the mating portion of the point section and another standard rail
28 section is secured to the mating portion of the body section. The point section and joined
29 standard rail section are positioned on the first base plate and the body section and joined

standard rail section are positioned on the second base plate. The accepting portion is clamped to the first base plate and the interface portion is clamped to the second base plate. The quick release fasteners are engaged with a flange of the point section, a flange of the body section, and a flange of each of the standard rail sections to secure the point section, body section, and standard rail section to the base plates.

Brief Description of the Drawings

FIG. 1 is a top plan view of a bridge joint constructed in accordance with this invention.

FIG. 2 is a cross sectional view taken along line 2--2 of FIG. 1.

FIG. 3 is a cross sectional view taken along line 7--7 of FIG. 1.

FIG. 4 is a cross sectional view taken along line 8--8 of FIG. 1.

FIG. 5 is a cross sectional view taken along line 5--5 of FIG. 1.

FIG. 6 is a cross sectional view taken along line 6--6 of FIG. 1.

FIG. 7 is a cross sectional view taken along line 3--3 of FIG. 1.

FIG. 8 is a cross sectional view taken along line 4--4 of FIG. 1.

Best Mode for Carrying Out the Invention

Referring to FIG. 1, a bridge joint 10 constructed in accordance with this invention has generally a moveable body section 12 interfacing with a fixed point section 14. Moveable body section 12 is joined to a planar body base plate 16 and fixed point section 14 is joined to a planar point base plate 18. Standard rail sections 20 abut the ends of moveable body section 12 and fixed point 14 sections and are joined to base plates 16, 18. Moveable body section 12, fixed point 14, and standard rail 20 sections align on longitudinal rail axis A. One bridge joint 10 is used to join one run of standard rail 20, thus in a conventional railway having parallel paired rails 20, two bridge joints 10 would be used at each desired point.

Moveable body section 12 is large cast piece with integral features thereon. When viewed from above (FIG. 1) moveable body section 12 has two distinct portions,

1 a guard 22 and body member 24. Body member 24 is centered about axis A with a top
2 surface that is substantially continuous with the top surface of standard rail 20 and
3 generally forms the surface that a rail car rides on. Guard 22 is an integrally formed
4 component of body section 12 that runs generally longitudinally alongside axis A, curves
5 toward axis A in the center, and outward at both ends. Guard 22 is positioned on a
6 forward portion of moveable body section 12 and together with body member 24, forms
7 a forward interface section 23.

8 As seen in FIG. 2, body member 24 is supported by outer body web 26 and inner
9 body web 28, and guard 22 is supported by guard web 30. Rearwards of guard 22, the
10 lower ends of outer and inner body webs 26, 28 flare away from axis A to form an outer
11 flange 32 and an inner flange 34 (FIG. 3). As seen in FIG. 1, the rearward end of body
12 section 12 is angled relative to axis A to accept standard rail 20 with a mating angle and
13 the termination inner body web 28. Outer body web 26, outer flange 32, and a portion
14 of body member 24 extend rearward to form a standard rail mating section 36. Referring
15 to FIG. 4, mating section 36 has lateral projections 38 adapted to laterally abut and secure
16 standard rail section 20. Rearwards of guard 22, webs 26, 28 have transverse bolt holes
17 40 through which a clamping member 42 is bolted (FIG. 1). Clamping member 42 has
18 lateral projections 44 adapted to laterally abut and secure standard rail section 20.
19 Standard rail section 20 is placed between mating section 36 and clamping member 42
20 and bolted to moveable body section 12 through bolt holes 40. Clamping member 42 is
21 also independently bolted to body section 12.

22 Referring again to FIG. 1, the central portion of body section 12 has a plurality
23 of clamping lugs 46 integrally formed on guard web 30 and outer body web 26.
24 Clamping lugs 46 are substantially rectangular, but narrow slightly near their top as
25 measured parallel to axis A. A plurality of clamps 48 correspond to clamping lugs 46
26 and can be seen in FIG. 2. Clamps 48 consist of one or more threaded members 50, a
27 clamping member 52, and a clamp base 54. Clamp base 54 is secured to base plate 16
28 and holds threaded member 50 to face upward. A clamping member 52 adapted to
29 engage and retain vertical and horizontal movement of clamping lug 46 is placed over

1 threaded member 50 and secured with a nut 56. With nut 56 tightened on clamping
2 member 52, body section 12 is secured to body base plate 16. Secured body section 12
3 is positioned so that a portion of forward interface section 23 extends off of base plate 16.

4 Referring to FIG. 1, a plurality of notches 58 in flanges 32, 34 partially accept
5 corresponding quick release fasteners 60 secured to base plate 16. Fasteners 60 are quick
6 release rail fasteners known to those skilled in the art. Each fastener 60 is secured to a
7 stop block 62 (FIG. 3) which is secured to base plate 16. Stop block 62 engages notch
8 58 and prevents movement of moveable body section 12 along axis A. Fastener 60 has
9 a shoulder plate 64 joined to stop block 62 and a spring clip 66 arranged such that spring
10 clip 66 can be driven into shoulder plate 64 and a portion of spring clip 66 will exert a
11 downward force on moveable body section 12 thus securing moveable body section 12
12 to base plate 16. Additional quick release fasteners 60 secured to base plate 16 are
13 provided to secure standard rail section 20. These additional fasteners 60 are not on stop
14 plates 62, but are attached directly to base plate 16.

15 Fixed point section 14 is a large cast piece with integral features fixed point
16 section 14 has a point member 68 centered about axis A and substantially continuous
17 with the top surface of standard rail 20 and body member 24. As seen in FIG. 5, point
18 member 68 is supported by an outer point web 70 and inner point web 72. The lower
19 ends of outer and inner fixed point webs 70, 72 flare away from axis A to from an outer
20 flange 74 and an inner flange 76. Referring again to FIG. 1, the rearward end of fixed
21 point 14 is angled like the rearward end of moveable body section 12 to accept standard
22 rail 20 with a mating angle and the termination of inner point web 72. Outer point web
23 70, outer flange 74, and a portion of point member 68 extend rearward to form a standard
24 rail mating section 36 as described above. Standard rail 20 is placed abutting mating
25 section 36. A clamping member 42 is bolted to fixed point 14 and standard rail 20 as
26 discussed above.

27 Opposite mating section 36 of fixed point section 14 is an integral accepting
28 portion 80 which slidably accepts interface section 23 of moveable body section 12.
29 Point member 68 narrows at an acute angle relative to axis A and interface section 23 has

1 a corresponding notch 78 adapted to accept point member 68. Accepting portion 80 has
2 spaced side walls 82 adapted to closely abut forward interface section 23 and maintain
3 its alignment about axis A. Accepting portion 80 has a plurality of spaced clamping lugs
4 46 as described above and corresponding clamps 48 on base plate 18 secure it to point
5 base plate 18. A plurality of quick release fasteners 60 on stop blocks 62 attached to base
6 plate 18 reside in notches 58 in the rearward portion of fixed point section 14 and secure
7 fixed point 14 to base plate 18. Additional fasteners 60 not on stop blocks secure
8 standard rail section 20.

9 Though the above embodiment is disclosed using the preferable combination of
10 clamps 48 and quick release fasteners 60, it is also possible to use entirely clamps 48 or
11 entirely quick release fasteners 60 to hold the body section 12 and point section 14 to
12 their respective base plates.

13 In operation, moveable body section 12 is secured to body base plate 16 and fixed
14 point section 14 is secured to point base plate 18 and are free to move relative to each
15 other with their respective base plates 16, 18 along axis A while remaining substantially
16 continuous. As moveable body section 12, fixed point 14, and standard rail 20 wear, they
17 can be removed and replaced without removing base plates 16, 18 from the bridge or
18 structure to which they are attached. Bridge joint 10 is disassembled by loosening nuts
19 56 and disassembling clamps 52. No access beneath base plates 16, 18 is required.
20 Standard rail section 20 is unbolted from mating sections 36 of moveable body section
21 12 and fixed point section 14, and rail clamping members 42 are removed. Quick release
22 fasteners 60 are released by driving spring clips 66 out of shoulder plates 64. Moveable
23 body section 12 and fixed point section 14 can then be lifted vertically from base plates
24 16, 18 and scrapped. Standard rail sections 20 can also be removed as they are no longer
25 secured to base plates 16, 18.

26 Bridge joint 10 can be reassembled by positioning the forward end of moveable
27 body section 12 in the accepting portion 80 of fixed point section 14. Moveable body
28 section 12 and fixed point section 14 are then placed on body base plate 16 and point
29 base plate 18 respectively. Clamps 48 are assembled and nuts 56 are tightened, partially

1 securing moveable body section 12 and fixed point section 14 to their respective base
2 plates 16, 18. Standard rail section 20 is placed abutting mating section 36 of moveable
3 body section 12. Rail clamping member 42 is placed abutting standard rail section 20
4 and body section 12 and all three are bolted together. A second standard rail section 20
5 is secured to fixed point section 14 in the same manner. Spring clips 66 are then driven
6 into each shoulder plate 64 of each quick release fastener 60 to secure the remaining
7 portions of moveable body section 12 and fixed point section 14 and secure standard rail
8 sections 20 to base plates 16, 18.

9 The present invention has many significant advantages. The present invention
10 employs a base plate which is separate from the bridge joint sections. The bridge joint
11 sections are not attached to the base plates with through bolts, thus do not require access
12 to the bottom side of the plates for removal. Bridge joint sections can be removed with
13 simple hand tools leaving the base plates in position. Further, there are no welds that
14 must be ground to release the bridge joint sections.

15 While the invention has been shown in only one of its forms, it should be
16 apparent to those skilled in the art that it is not so limited, but is susceptible to various
17 changes without departing from the scope of the invention.

WHAT IS CLAIMED IS:

1. A bridge joint for use with a railroad track having standard rail sections, said bridge joint comprising:

first and second planar base plates, each having an upper side and a lower side;

a point section detachably mounted on said first base plate, said point section having a forward integral accepting portion with a point and flanges rearward of said accepting portion;

a body section detachably mounted on said second base plate, said body section having a forward interface portion adapted to be slidably accepted in said accepting portion, an accepting notch adapted to accept said point, and flanges rearward of said interface portion; and

a plurality of fasteners secured to said base plates for engaging said flanges and securing and retaining said point section to said first base plate and said body section to said second base plate, said fasteners being operated exclusively from the upper sides of the first and second base plates.

2. The bridge joint of claim 1 further comprising:

a plurality of clamping lugs positioned on said point section and said body section; and

a plurality of clamps corresponding to said clamping lugs, said clamps having clamping members adapted to engage and restrain vertical and horizontal movement of said clamping lugs and being releasably secured to said base plates.

3. The bridge joint of claim 2 wherein said clamping lugs are on said accepting portion.

4. The bridge joint of claim 2 wherein said clamping lugs are on said interface portion.

5. The bridge joint of claim 1 wherein said fasteners are quick release fasteners and have a base and said flanges have notches adapted to engage said base.

6. The bridge joint of claim 1 wherein:

said point section has a rearward standard rail mating portion adapted to laterally abut and join with one of said standard rail sections;

said body section has a rearward standard rail mating portion adapted to laterally abut and join with one of said standard rail sections; and

said standard rail section has a flange opposed to said mating section, said flange being secured to said base plate with said fasteners.

7. The bridge joint of claim 1 wherein said forward accepting portion has spaced side walls positioned closely adjacent said interface portion.

8. A bridge joint for use with a railway, said railway having a pair of parallel standard rails, said joint comprising:

first and second base plates, each having an upper side and a lower side;

a point section detachably mounted on said first base plate, said point section having a forward integral accepting portion with a point and a rearward standard rail mating portion for joining to one of said standard rails;

a body section detachably mounted on said second base plate, said body section having a forward interface portion adapted to be slidably accepted in said accepting portion, a notch in said interface portion adapted to accept said point, and a rearward standard rail mating portion for joining to one of said standard rails;

a plurality of clamping lugs positioned on said point section and said body section;

a plurality of clamps secured to said base plates and corresponding to said clamping lugs for engaging said clamping lugs and securing and retaining said point section to said first base plate and said body section to said second base plate; and

the point section and the body section are detachably mounted to the respective first and second base plates exclusively from the upper sides thereof, such that no access to the lower sides thereof is required to attach or remove the point section and the body section therefrom.

1 9. The bridge joint of claim 8 wherein said clamping lugs are on said accepting
2 portion.

3 10. The bridge joint of claim 8 wherein said clamping lugs are on said interface
4 portion.

5 11. The bridge joint of claim 8 wherein said accepting portion has spaced side walls
6 positioned closely adjacent said interface portion.

7 12. The bridge joint of claim 8 wherein:
8 said point section has flanges rearward of said accepting portion;
9 said body section has flanges rearward of said interface portion; and
10 said base plates have quick release fasteners secured thereto, said quick release
11 fasteners having spring clips for engaging said flanges and securing said point section to
12 said first base plate and said body section to said second base plate.

13 13. The bridge joint of claim 12 wherein said standard rail sections have flanges and
14 said base plates have quick release fasteners for engaging said flanges and securing said
15 standard rail sections to said base plates.

16 14. The bridge joint of claim 12 wherein said quick release fasteners have a base and
17 said flanges have notches adapted to engage said base.

18 15. The bridge joint of claim 8 wherein said standard rail sections have flanges and
19 said base plates have quick release fasteners for engaging said flanges and securing said
20 standard rail sections to said base plates.

21 16. A method of allowing for expansion and contraction in a railway, said railway
22 having standard rail sections with flanges, comprising the steps of:

providing a point section having an accepting portion, a standard rail mating portion, and flanges, a body section having an interface portion, a standard rail mating portion, and flanges, and first and second base plates having upper and lower sides with clamps and quick release fasteners for attachment only on the upper sides;

placing said interface portion in said accepting portion;

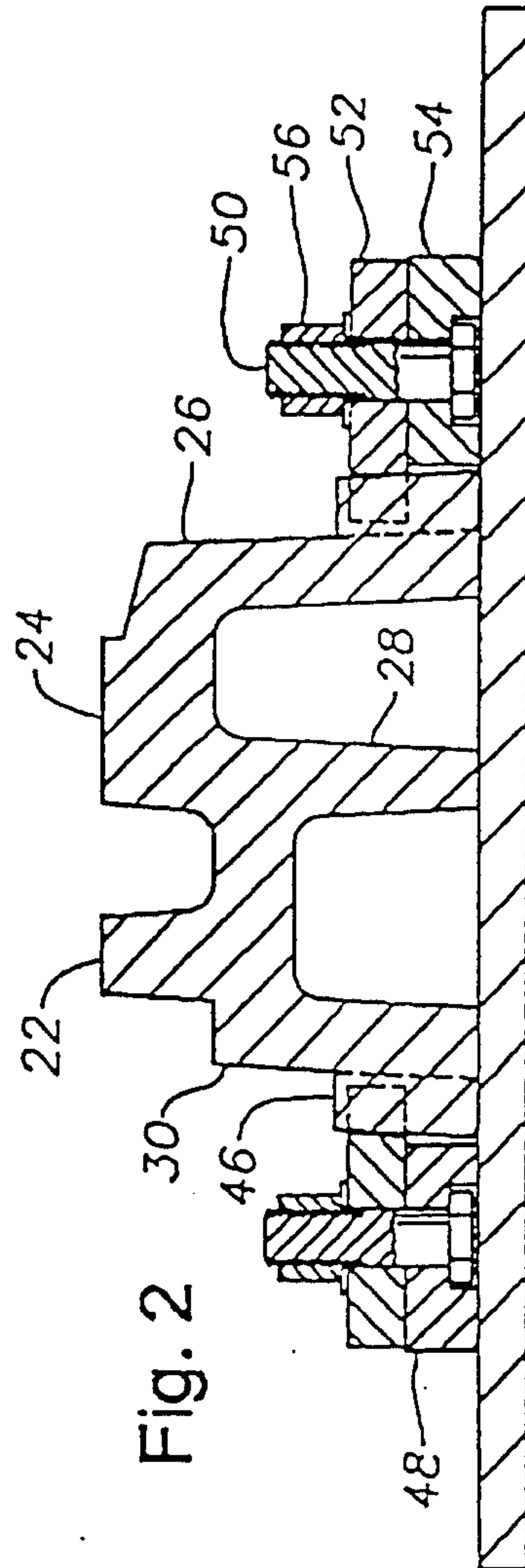
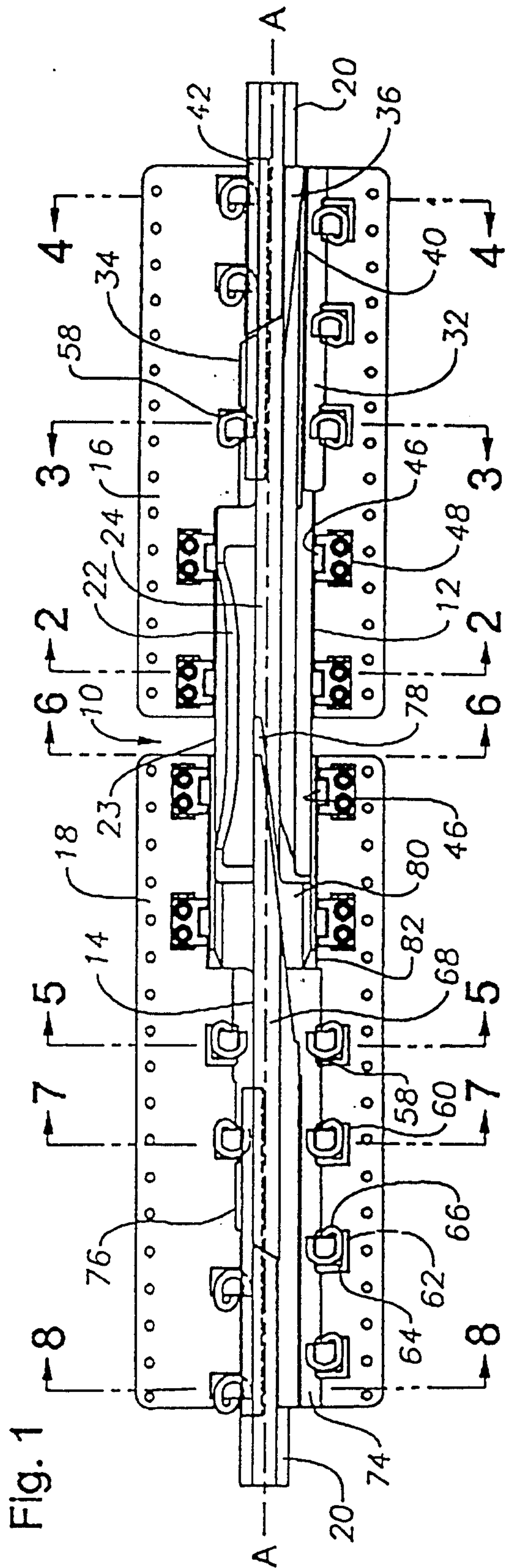
securing one of said standard rail sections to said mating portion of said point section and securing another of said standard rail sections to said mating portion of said body section;

positioning said point section and joined standard rail section on said first base plate and said body section and joined standard rail section on said second base plate;

clamping said accepting portion to said first base plate and said interface portion to said second base plate exclusively from and only to the upper sides of the first and second base plates without requiring access to the lower sides thereof; and

engaging said quick release fasteners with a flange of said point section, a flange of said body section, and a flange of each of said standard rail sections to secure said point section, said body section, and said standard rail sections to the upper sides said base plates.

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Fig. 3

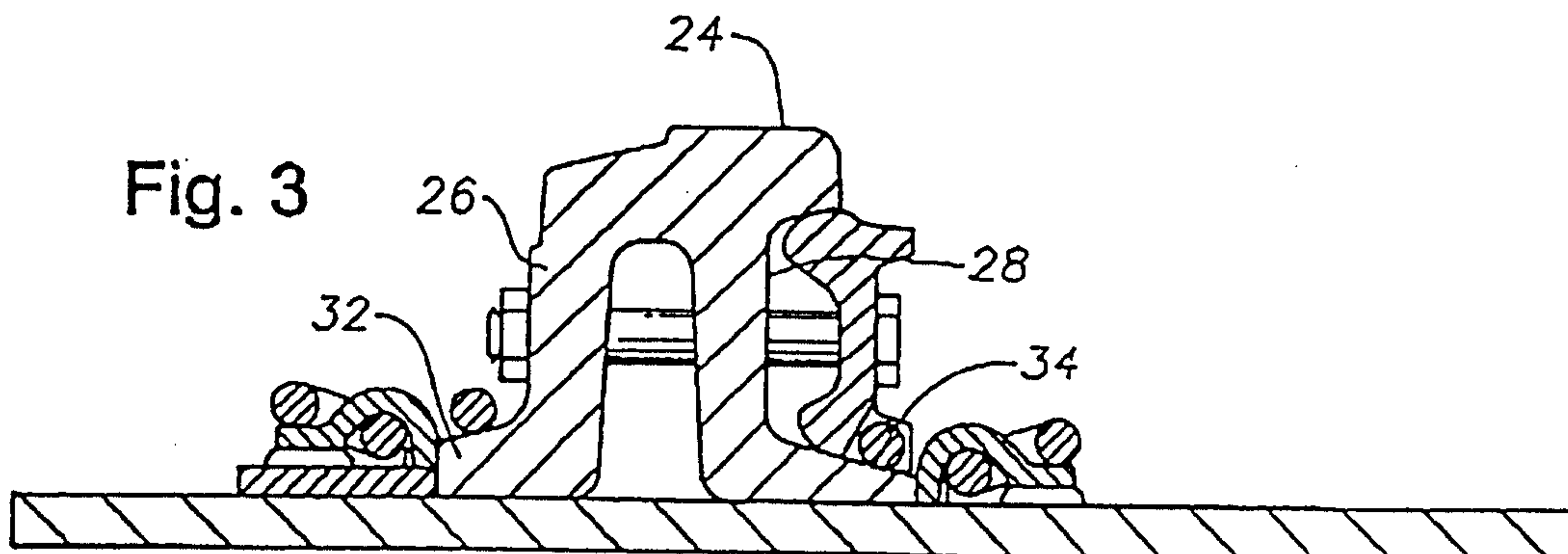


Fig. 4

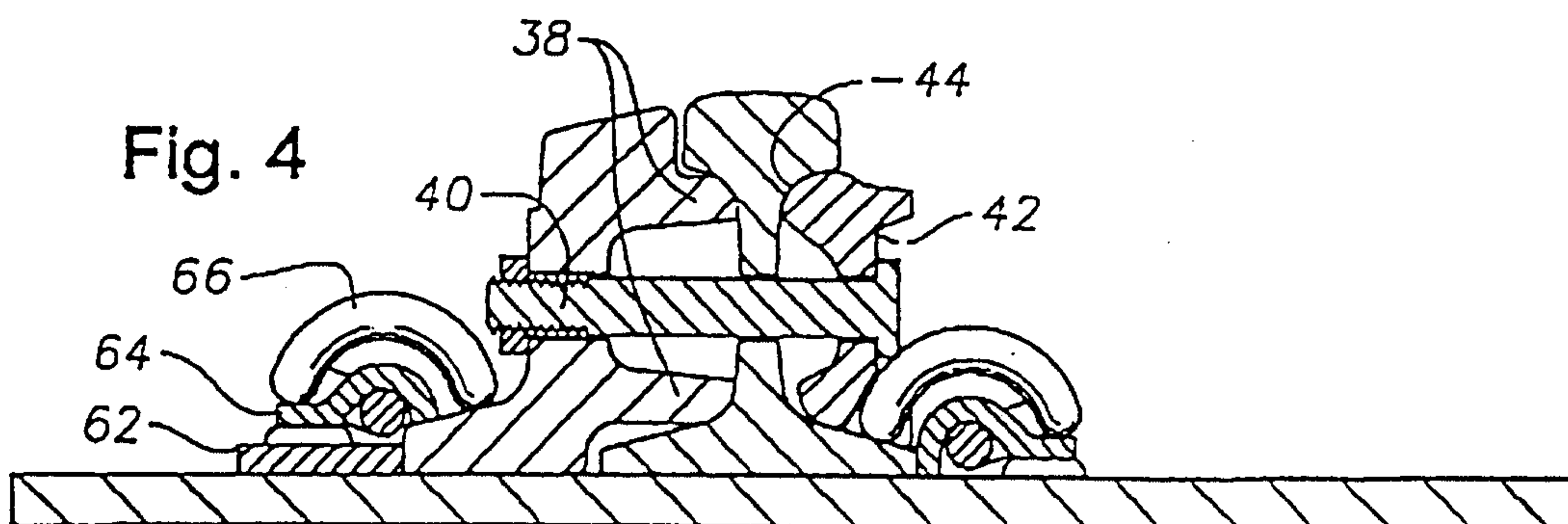
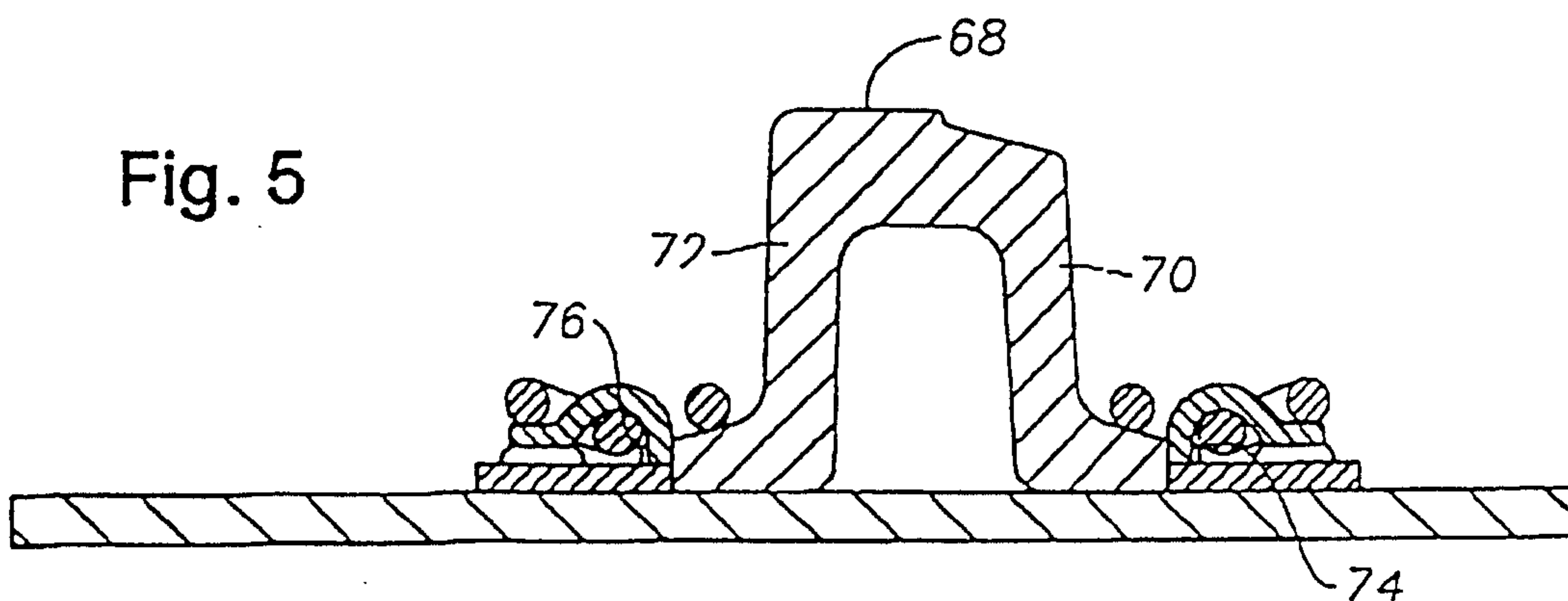


Fig. 5



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Fig. 6

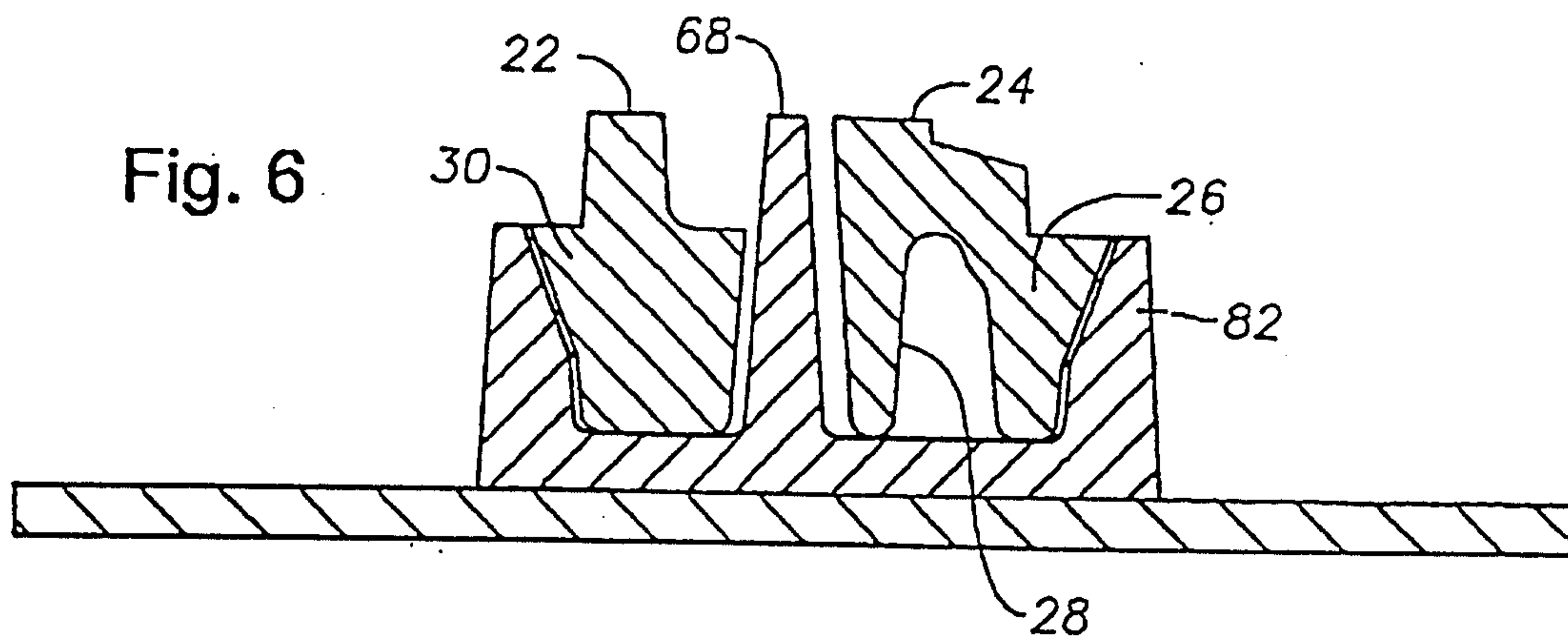


Fig. 7

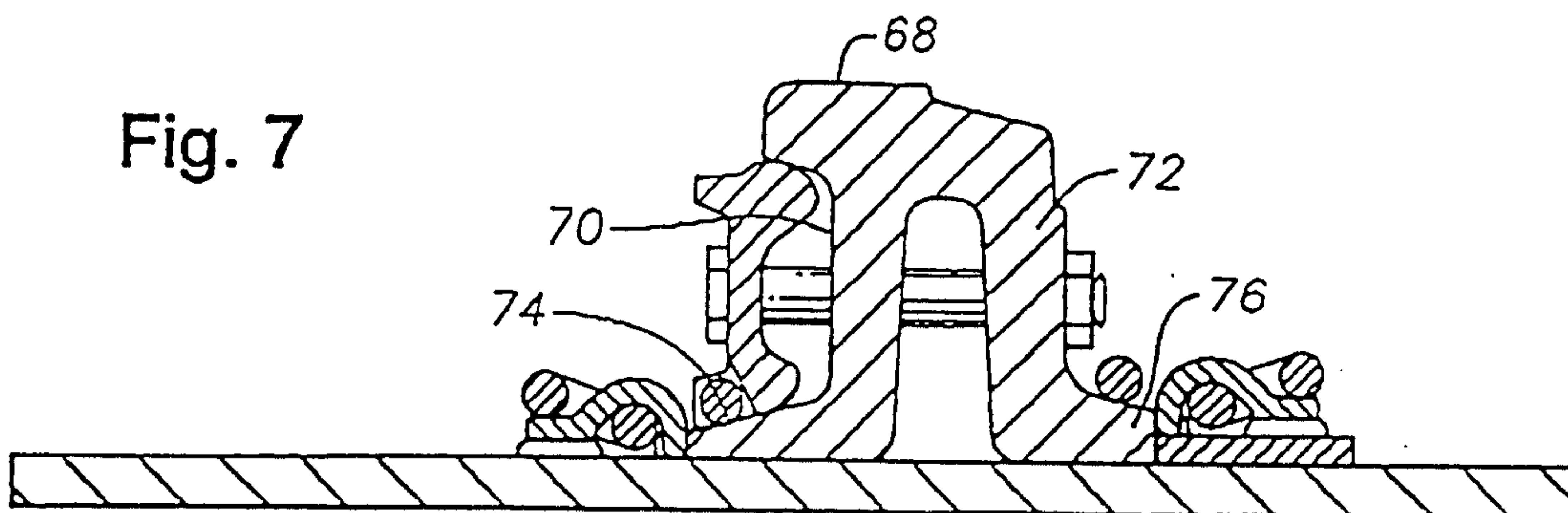


Fig. 8

