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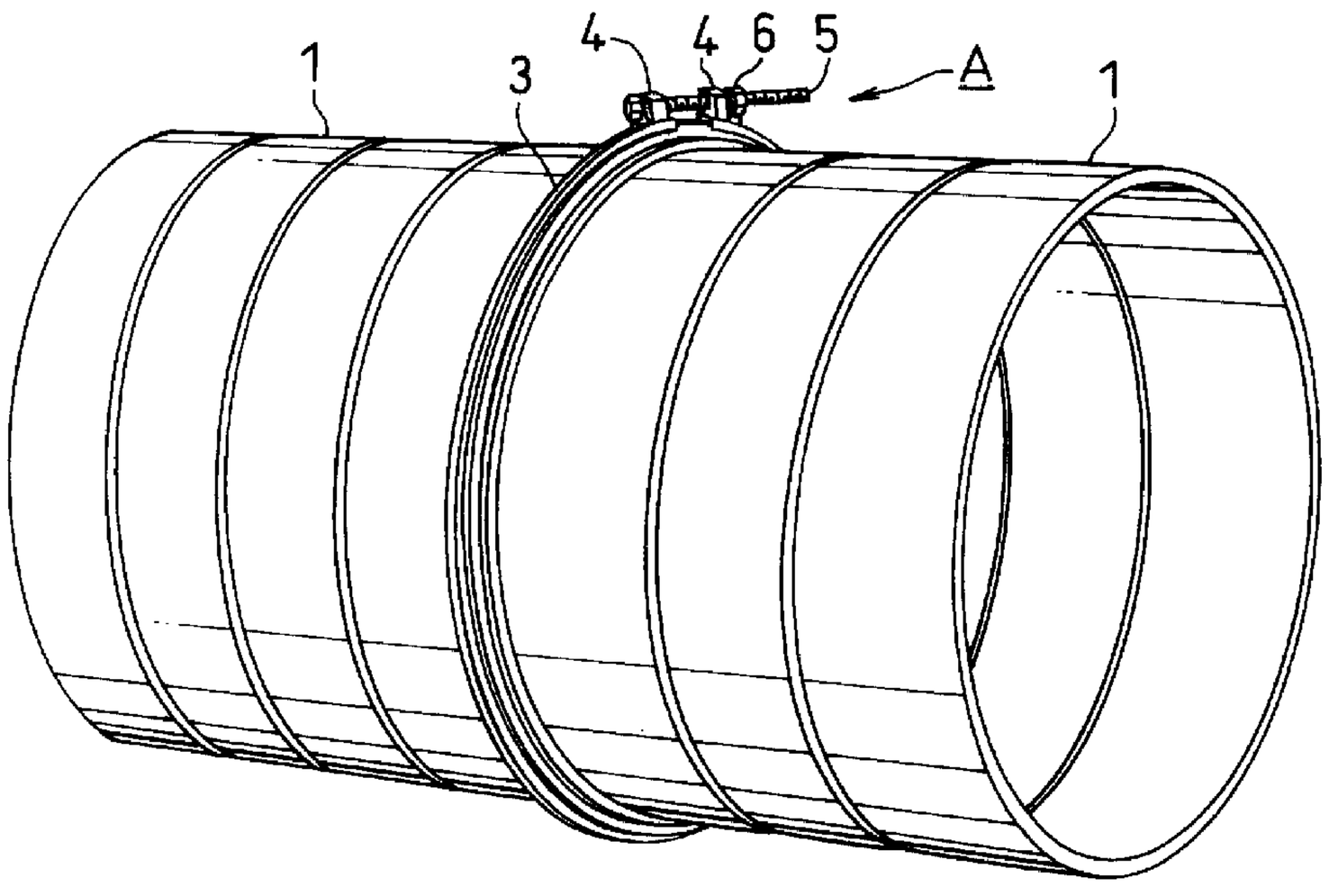
(54) **RACCORD DE CONDUIT**
(54) **DUCT CONNECTOR**



(57) A tubular duct has an outward flange on the outer circumferential surface at the end. To connect two tubular ducts, the outward flanges are both covered with a partially cut-out tightening ring. A metal fitting is projected at each end of the tightening ring. A screw rod is inserted into the opposing metal fittings. By rotating a nut around the screw rod, the tightening ring is tightened and shortened in diameter to connect the ducts tightly.

ABSTRACT OF THE DISCLOSURE

A tubular duct has an outward flange on the outer circumferential surface at the end. To connect two tubular ducts, the outward flanges are both covered with a partially cut-out tightening ring. A metal fitting is projected at each end of the tightening ring. A screw rod is inserted into the opposing metal fittings. By rotating a nut around the screw rod, the tightening ring is tightened and shortened in diameter to connect the ducts tightly.

SPECIFICATION

DUCT CONNECTOR

BACKGROUND OF THE INVENTION

The present invention relates to a duct connector for connecting tubular ducts to each other.

To connect the ends of tubular ducts having the same diameter and opposing to each other, outward flanges each of which has a plurality of bores is fixed on the outer circumferential surface at the end of the duct by welding, and bolts are inserted in the bores of the outward flanges which are opposed to each other.

However, it requires troublesome working to machine the outward flanges, to weld the outward flanges to the ducts and to tighten or disassemble the opposing outward flanges.

In another way, opposing outward flanges are covered with a reversely V-sectioned tightening ring. A screw rod which is curved at substantially the same curvature as the tightening ring and mounted to one end of the ring is inserted into a tubular metal fitting mounted to the other end of the ring. By engaging a nut on the end of the screw rod which projects from the metal fitting, the ring is shortened in diameter to tighten the opposing outward flanges.

However, the screw rod is curved. Thus, it is troublesome to manufacture the rods, and it takes a lot of time to tighten and disassemble the opposing outward flanges.

In the latter, the screw rod and metal fitting are welded to the outer circumferential surface of the tightening ring. Therefore, during tightening or in use, if any material hits the duct, the screw rod or metal fitting will be broken and the duct will go down, which is

dangerous.

SUMMARY OF THE INVENTION

Therefore, it is an object of the invention to overcome the foregoing disadvantages in the prior art.

According to the present invention, there is provided a duct connector for connecting two tubular ducts at opposing ends which have outward flanges respectively, comprising a reversed-V-sectioned partially cut-out tightening ring with which said outward flanges are covered; a metal fitting which is attached at each end of the tightening ring; a screw rod which is inserted in the metal fittings; and a nut in which the screw rod is engaged, thereby shortening the tightening ring in diameter to bind said outward flanges to each other

The screw rod is not fixed to the tightening ring. The screw rod may be inserted into the metal fitting and tightened, thereby facilitating manufacturing and tightening of the connection.

BRIEF DESCRIPTION OF THE DRAWINGS

The features and advantages of the present invention will become more apparent from the following description with respect to embodiments as shown in attached drawings wherein:

Fig. 1 is a perspective view of tubular ducts before a tightening ring is tightened in the first embodiment of a duct connector of the present invention;

Fig. 2 is an enlarged front view of a main portion of the connector in Fig. 1;

Fig. 3 is an enlarged front view after the tightening ring is tightened;

Fig. 4 is an exploded perspective view which illustrates a metal

fitting and a tightening ring;

Fig. 5 is a vertical sectional view taken along the line V-V in Fig. 3;

Fig. 6 is an enlarged front view of a main portion before a tightening ring is tightened in the second embodiment of the present invention;

Fig. 7 is an enlarged front view of the second embodiment after the ring is tightened; and

Fig. 8 is an exploded perspective view of a metal fitting, a seat plate and a spring washer in Figs. 6 and 7.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

Fig. 1 illustrates one embodiment of the present invention, in which two tubular ducts 1,1 which are equal in diameter to each other are connected at the ends by a duct connector "A" according to the present invention.

Figs. 2 to 5 illustrate the details of the connector "A" for binding outward flanges 2,2 which are integrally formed with the opposing ends of the tubular ducts 1,1. The connector "A" comprises a tightening ring 3 which covers the opposing outward flanges 2,2, metal fittings 4,4 mounted at the ends of the tightening ring 3, a screw rod 5 which is inserted in the metal fittings 4,4, and a nut 6 which is engaged on the screw rod 5.

The tightening ring 3 has a reversed-V-section and is partially cut out. The tightening ring 3 is slightly smaller in circumference than the outward flange 2, and it curvature is slightly larger than that of the outward flange 2.

As shown in Figs. 4 and 5, the tightening ring 3 has reversed-

V-section which comprises sides 3a,3a. A top wall 3b between the sides 3a and 3a has a flat surface. Thus, the outward flanges 2,2 opposing to each other are effectively introduced and firmly placed under the top wall 3b. As shown in Fig. 4, the metal fitting 4 comprises stopper portions 4c,4c at the sides 4b,4b of an upper portion 4a, and an engagement portions 4d,4d which are inclined at substantially equal angle to the sides 3a,3a of the tightening ring 3.

The upper portion 4a and the stopper portions 4c,4c of the metal fitting 4 are inserted into a rectangular opening 3b of the tightening ring 3, and the engagement portions 4d,4d are engaged on the inner surface of the sides 3a,3a of the tightening ring 3 and fixed to the ring 3 by spot or projection welding. The screw rod 5 has a head 5a at one end and fitted in the nut 6 at the other end. Instead of the head 5a, another nut may be used.

A curved rectangular seat plate 8 which has a central opening 8a is contacted with the upper portion 4a of the metal fitting 4. The upper edge of the seat plate 8 is engaged with the outer edge of the sides 4b of the metal fitting 4, and the lower edge of the seat 8 is engaged with a inner corner between the sides 4b,4b and the stopper portions 4c,4c.

Through the upper portions 4a,4a of the metal fittings 4,4 and the openings 8a,8a of the curved seats plates 8,8, the screw rod 5 is penetrated, and the tightening nut 6 is engaged on the end of the screw rod 5.

As shown in Fig. 5, an annular packing 9 is put between the outward flanges 2,2 of the tubular ducts 1,1 and the outer circumference of the flanges 2,2 is covered with the spread tightening

ring 3. Thereafter, the nut 6 is tightened. As the metal fittings 4,4 comes to each other, the tightening ring 3 becomes smaller in diameter. The sides 3a, 3a cause the outward flanges 2,2 to come together and are contacted with each other by force, so that the tubular ducts 1,1 are connected tightly.

One end of the curved seat plate 8 is engaged on the inner corner between the side 4b and the stopper portion 4c of the metal fitting 4, thereby preventing the curved seat plates 8,8 from rotation and keeping the openings 8a,8a in an exact position, so that the screw rod 5 is held in a correct position.

Figs. 6 to 8 illustrate the second embodiment of the present invention. The same numerals are allotted to members which are the same as those in Figs. 1 to 5 and its description is omitted.

As shown in Fig. 8, a metal fitting 10 has a reversed-U-shaped upper portion 10a which has sides 10b,10b which has rounded side edges 10b',10b'. Stopper portions 10c,10c are formed and engagement portions 10d,10d are formed at the same angle as the inner surface of sides 3a,3a of the tightening ring 3.

It is similar to the first embodiment as to how to attach the metal fitting 10 to the tightening ring 3.

A flat rectangular seat plate 11 and a spring washer 12 are used. The seat plate 11 is determined in size such that an opening 11a has required height when it is engaged with the stopper portions 10c of the metal fitting 10.

In the second embodiment, after the tightening nut 6 is tightened, the rectangular seat plate 11 can be rotated over the side edges 10b' of the sides 10b of the metal fitting 10. Therefore,

bending force is not applied to the screw rod 5 regardless of tightening degree of the nut 6.

The foregoing merely relates to embodiments of the invention. Various changes and modifications may be made by person skilled in the art without departing from the scope of claims wherein:

WHAT IS CLAIMED IS:

1. A duct connector for connecting two tubular ducts at opposing ends which have outward flanges respectively, comprising:

a reversed-V-sectioned partially cut-out tightening ring with which said outward flanges are covered;

a metal fitting which is attached at each end of the tightening ring;

a screw rod which is inserted in the metal fittings; and

a nut in which the screw rod is engaged, thereby shortening the tightening ring in diameter to bind said outward flanges to each other.

2. A duct connector as defined in claim 1 wherein an opening is formed at each end of the tightening ring, an upper portion of the metal fitting into which the screw rod is inserted being put in said opening, the metal fitting being partially fixed to the tightening ring.

3. A duct connector as defined in claim 2 wherein said upper portion comprises sides and stopper portions, a lower edge of a curved seat plate being engaged with inner corners between the sides and the stopper portions, the screw rod being inserted into the upper portion and the seat plate.

4. A duct connector as defined in claim 2 wherein the upper portion of the metal fitting has a curved portion, a flat seat plate which has an opening being contacted with the curved portion of the upper portion, the screw rod being inserted into the seat plate and the metal

fitting.

5. A duct connector as defined in claim 4 wherein the flat seat plate is partially contacted with a stopper portion of the metal fitting.

6. A duct connector as defined in claim 2 wherein sides of the tightening ring is expanded, a top wall of the tightening ring comprising a flat surface slightly larger than width of the outward flanges and a packing between the flanges.

FIG.1

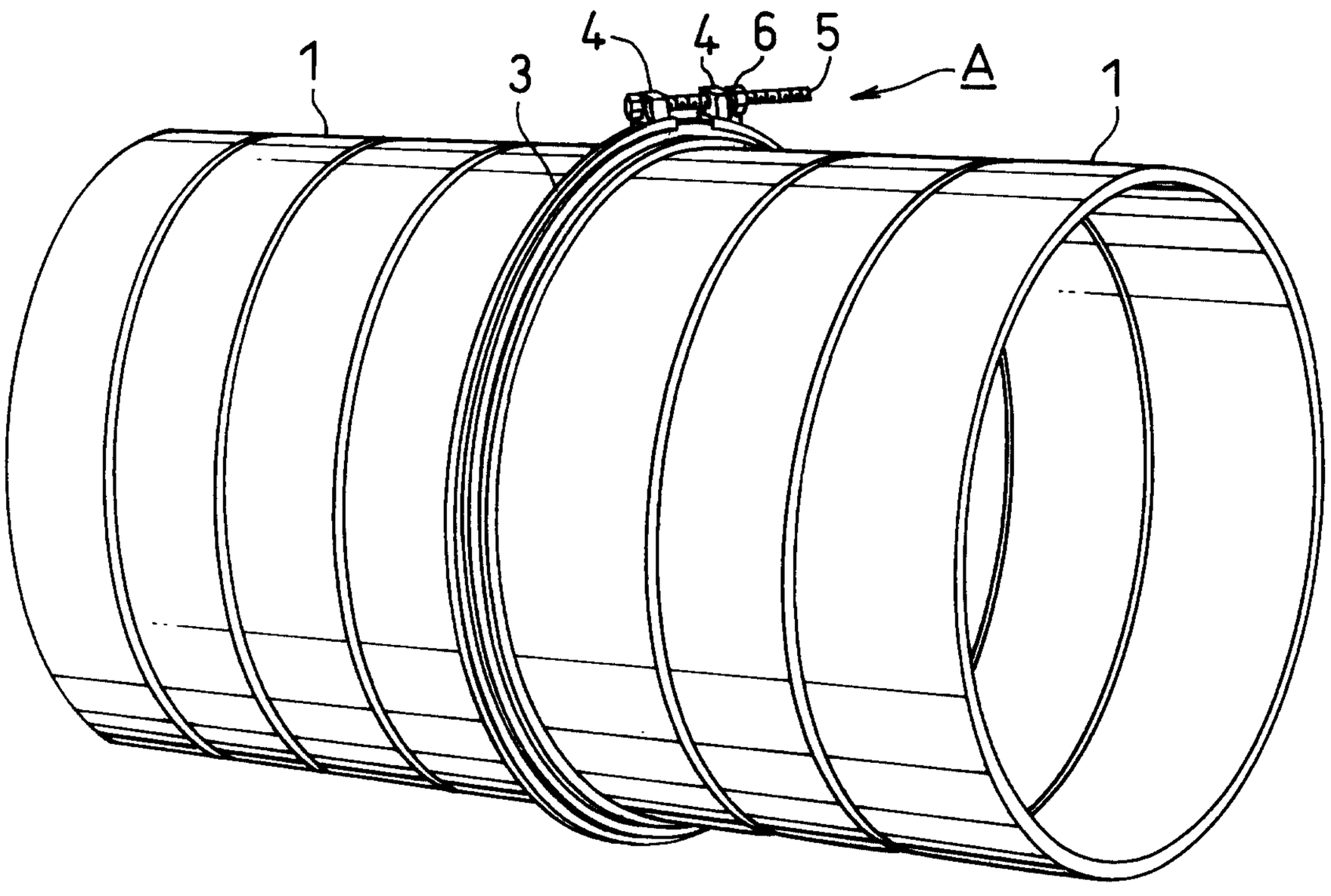


FIG.2

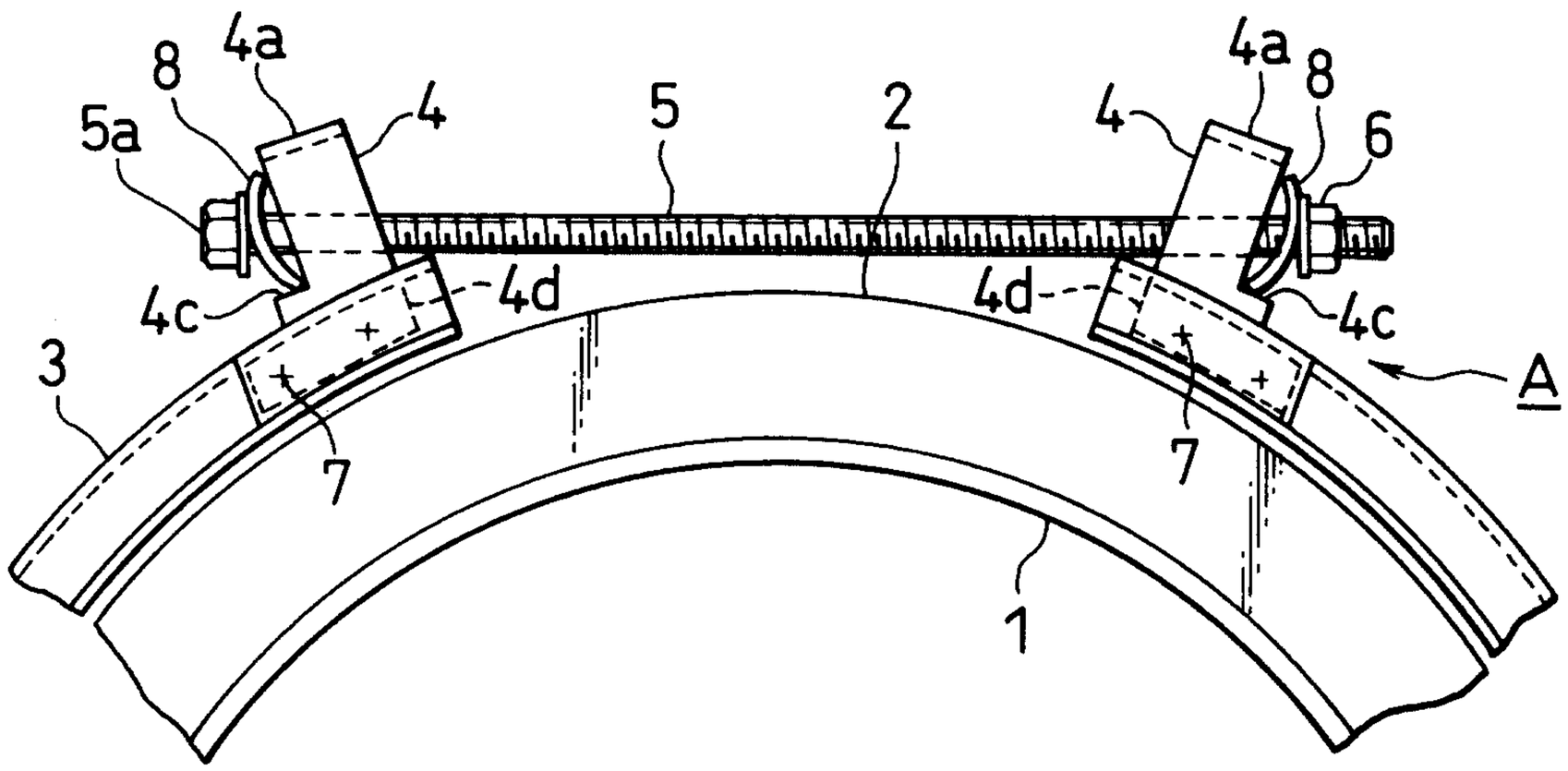


FIG.3

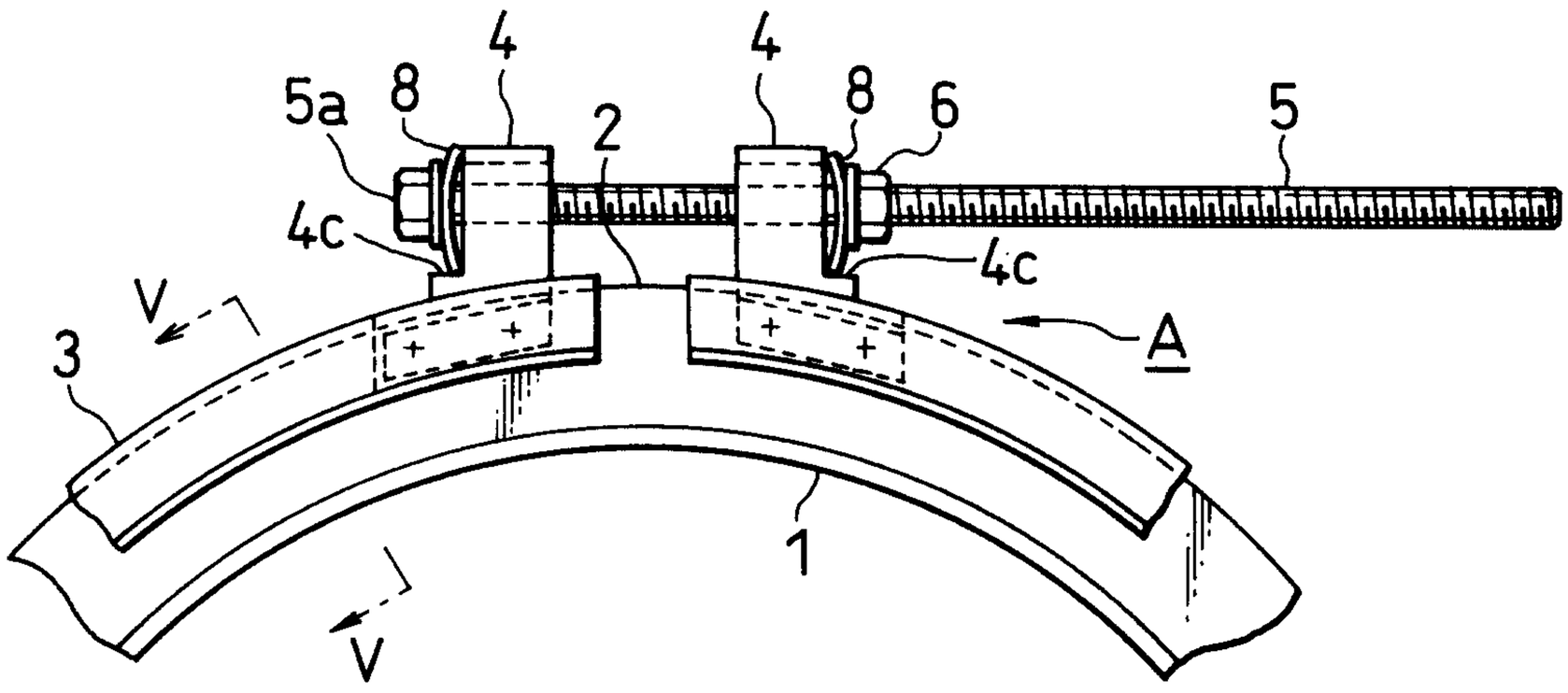


FIG.4

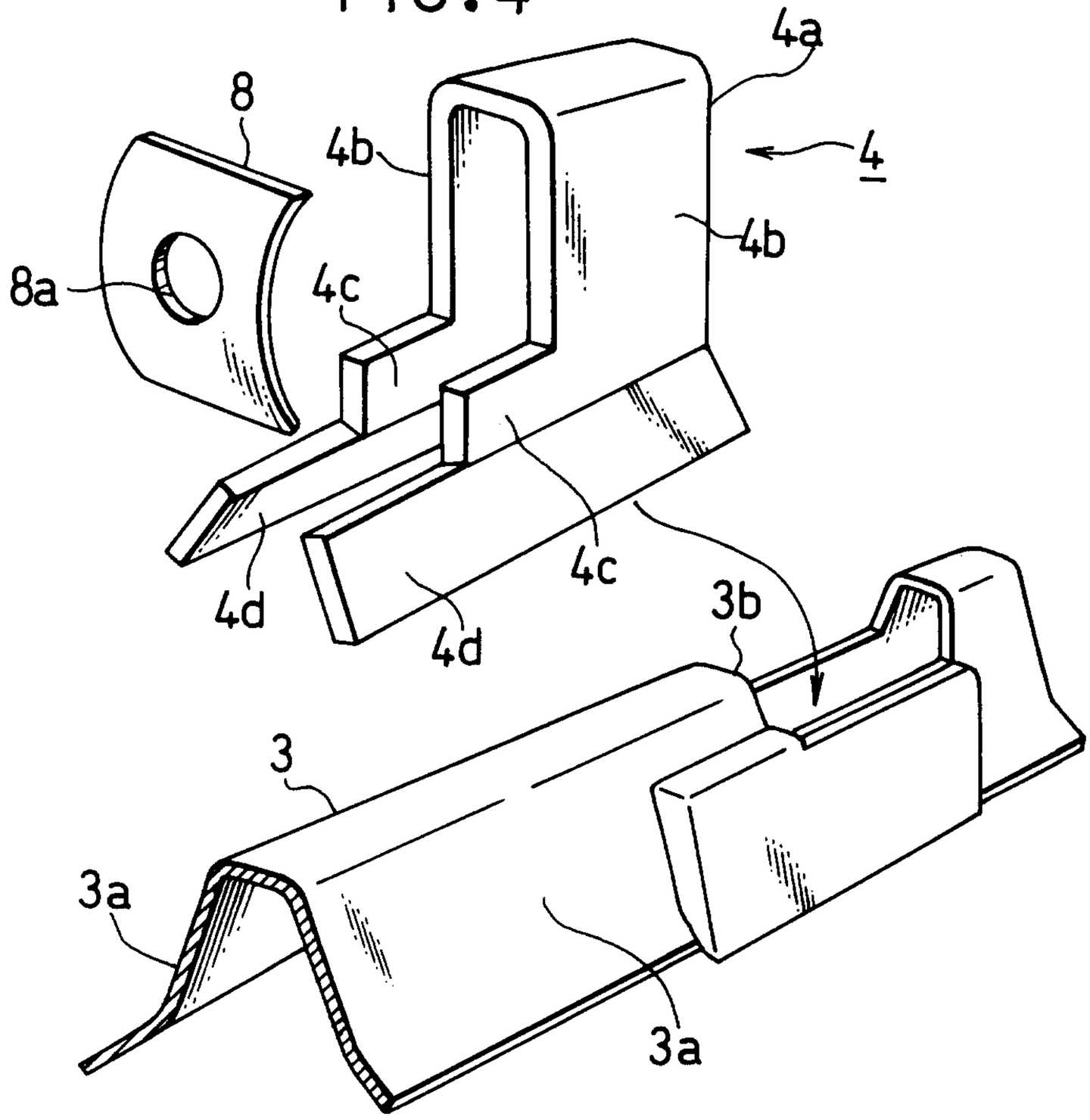


FIG.5

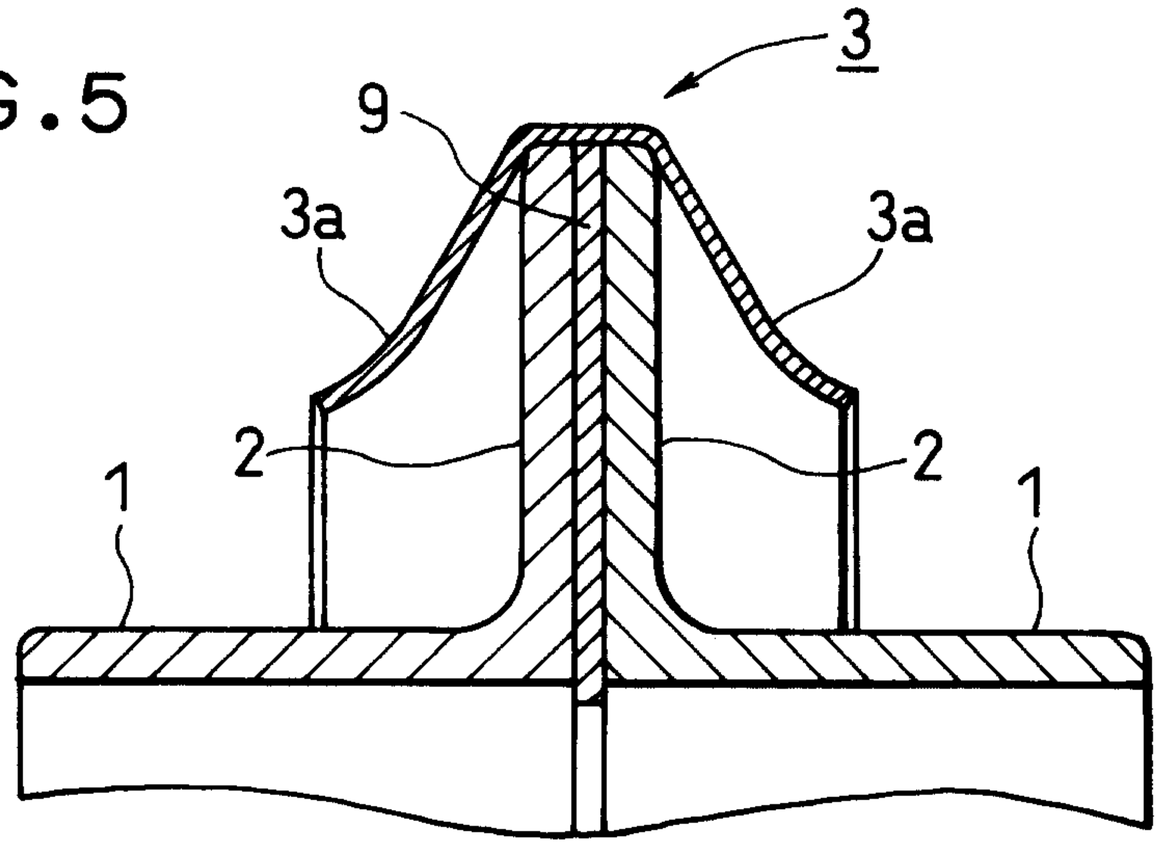


FIG.6

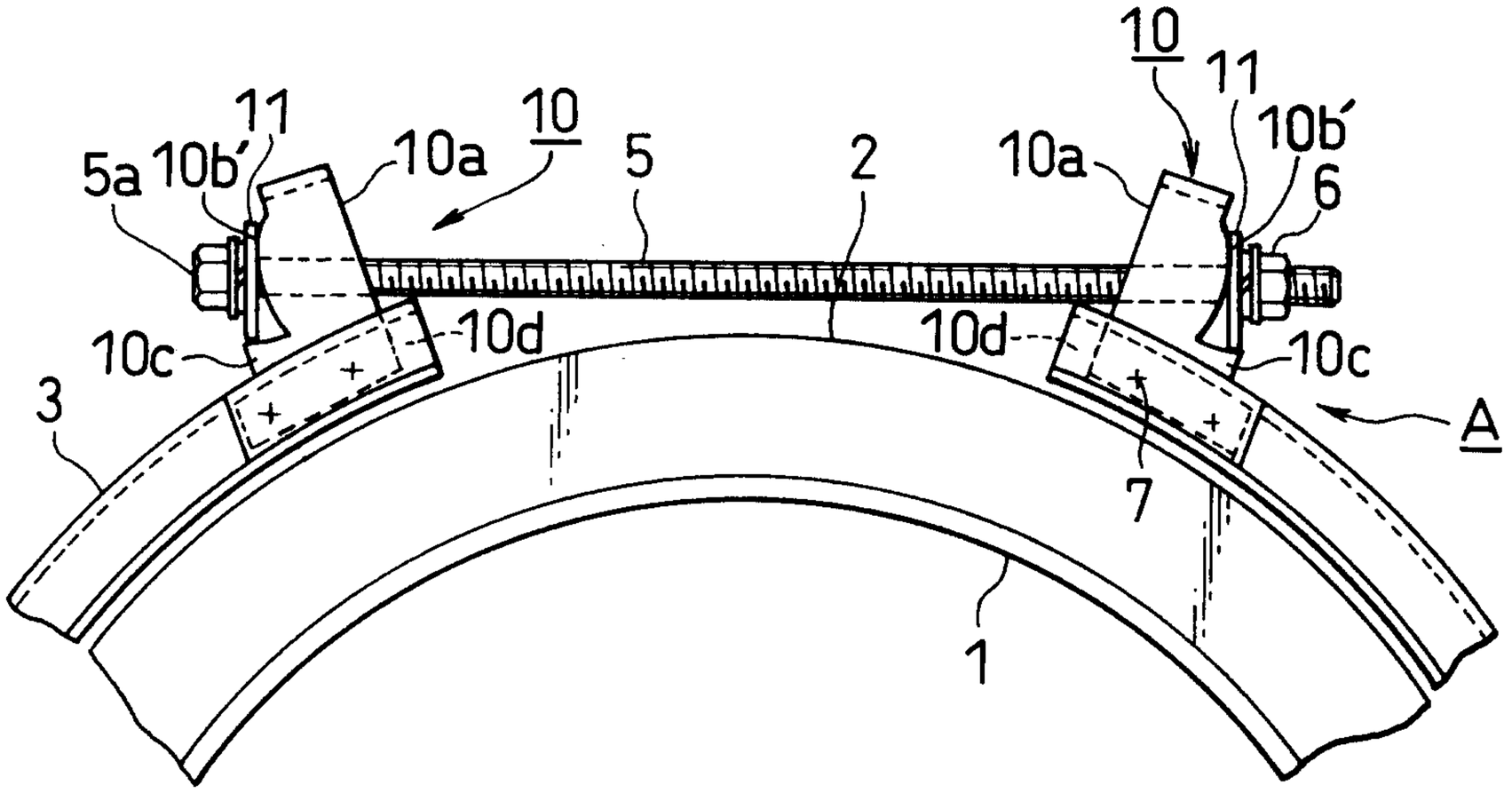
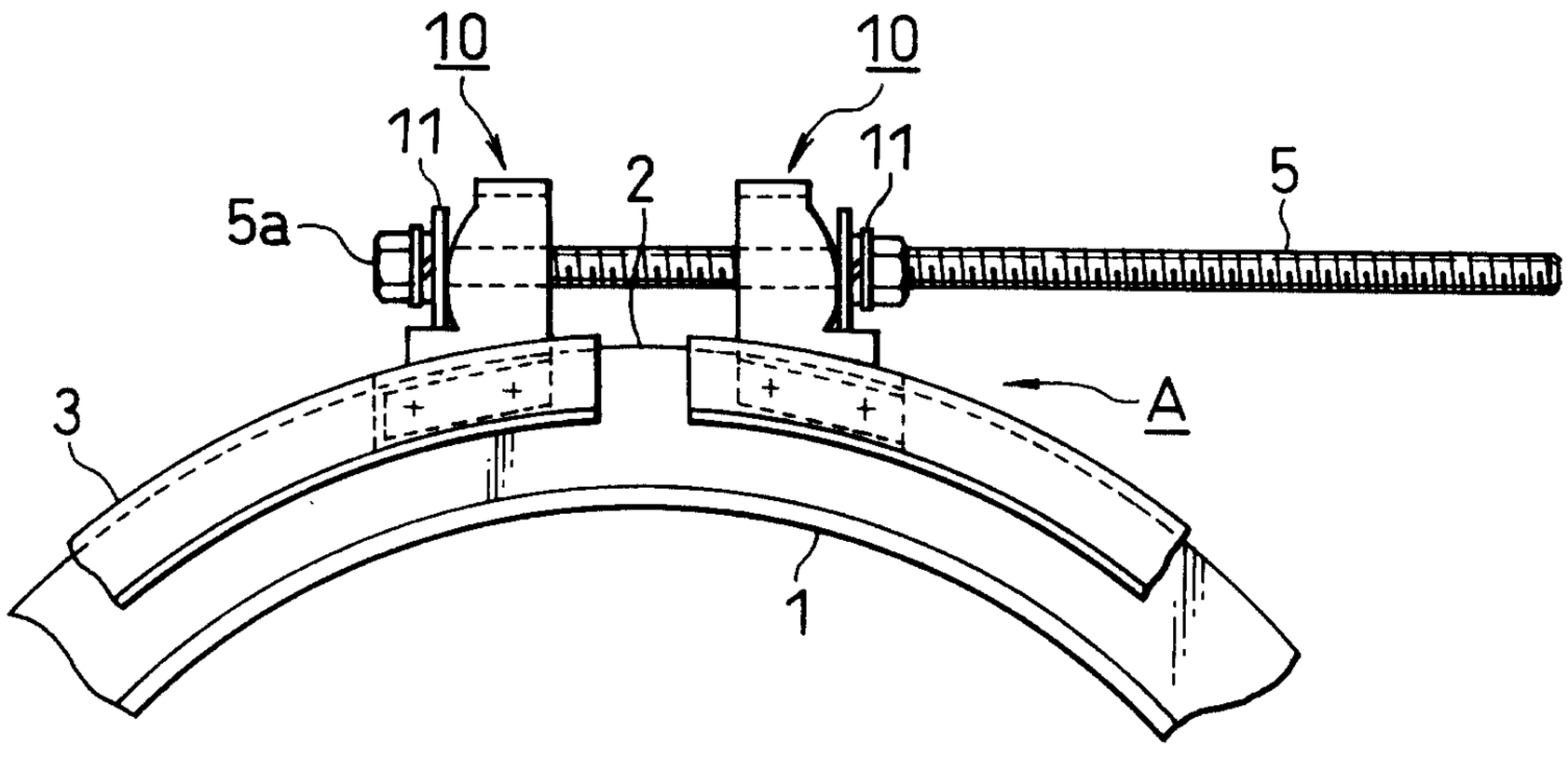

10
11
10b'
10a
10
5
2
10a
10
11
10b'
6
5a
10d
10d
10c
10c
3
A
7
1

FIG.7


10
10
11
11
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5a
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A
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FIG.8