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(54) Support mechanism for the electric resistance of heaters or boilers

(57) A support mechanism of the electric resistance in the heater/boiler which consists of the cap (2), FIG. 4.,the tubular bolt (7), which is fastened at the center of the cap (2) around the opening (3) in such away that it nestles outside the cord (or rim) (X). The rubber flange (10) is placed on the cord (X), the metal flange (4) with the electric resistance (5) and the magnesium rod (6) on the rubber flange.

Then the externally threaded tubular nut is manually screwed into the internally threaded bolt until the lower surface of the of the tubular nut touches the metal surface of the electric resistance (4).

In turn, a metal rod is inserted into the opening and the tubular nut is turned until it tightens completely the metal flange (4) of the electric resistance with the rubber flange (10).

In ths way we have secured the electric resistance and at the same time we have hermetically closed the opening (3) of the cap (2) of the heater/boiler (1).

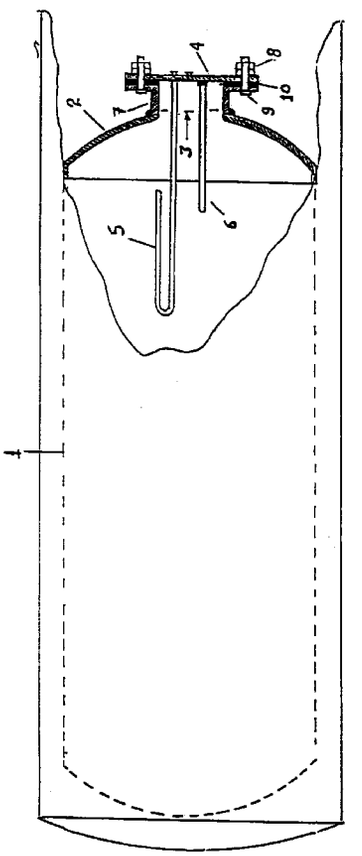

FIGURE 1

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Description

This invention is about the bottom cap of a heater or boiler. This cap has a central opening through which the the inner cylindrical surface of the heater/boiler is enameled (vitrified) and the electric resistance along with the water heating mechanism is placed.

Caps with such mechanisms are known. They have a metallic neck the outer end of which turns into a flange bearing eight holes. The other end is soldered circumferentially at the centre of the cap. On this cap the flange of the electric resistance is placed with the rubber flange in between and with the aid of eight bolts and nuts the resistance is fastened to close the cap opening.

The use of such a mechanism, in which the nuts are tightened to support the resistance and make it waterproof, tends to deform the metal surfaces of the mechanism. This in turn results to the cracking of the enamel of the inner surface of the heating apparatus, creating thus oxidation, water leakage from the heater or boiler and rendering the whole apparatus useless.

Caps fitted with mechanisms different from the one I have mentioned are those fitted with a clamp. The opening at the center of such a cap is oval in shape with a circumferential groove where the rubber flange of the electric resistance bearing a fixed bolt and nut is seated.

When the outer oval shaped metal flange as well as that of the resistance are tightened by the fixed bolt and nut, the metal flange is forced to press the rubber flange of the cap into the groove together with the electric resistance against the inner wall of the opening.

The purpose of the oval shaped opening in this case is to facilitate the insertion of the metal flange of the electric resistance into the boiler to tighten from the inside outwards. When using this type of mechanism the groove available for the position of the rubber flange causes problems to the enamel of the inner surface of the boiler, around and within the groove, resulting to lack of homogeneity in the mass of the enamel.

This non uniform thickness of the enamel makes it crack when the clamp is tightened: in turn, oxidation follows because of this problem, i.e. with this type of tghtening the electric resistance (clamp).Thus the whole heating apparatus soon becomes useless. Moreover, the temperature and the pressure of the water tend to push the rubber flange out of the groove and so there is leakage from the heater /boiler.

The only point in favour of this mechanism is its low cost.However, a host of disadvantages arise, as I have mentioned before. Therefore, its use is uneconomical and problem ridden.

Figure 1 shows a cross section of the support mechanism of the electric resistance with the neck from the existing heater.

Figure 2 shows the cross section of a cap with a clamp support mechanism from the existing heater.

The advantage of this invention is that the inner surface of this new type of support mechanism of the electric resistance does not come into contact with the water inside the boiler/heater, so the apparatus does not need enamelling (vitrification) but a mere coat of paint.

The support mechanism of the electric resistance in the heater/boiler, according to my invention,has the feature that it is done by a tubular nut. This nut presses uniformly on the periphery and at the same time the circumference of the electric resistance upon the rubber flange and in turn against the rim of the cap opening.

In this way we have secured a perfect waterproofing without creating bending of the metal surfaces during the tightening, avoiding thus cracking the enamel, which saves us the problem of oxidation and the consequently the uselessness of the whole boiler or heater.

As described, this invention aims at the improvement of these drawbacks. It solves the problem of cracking the enamel in the inner surface of the cap, it makes the installation and replacement of the electric resistance easier and ensures a perfect waterproofing. In this way we may avoid the quick wear of the heater / boiler rendering the whole apparatus more durable.

According to this invention, the support mechanism of the cap electric resistance in the heater or boiler has the feature that instead of an 8 bolt-and-nut neck to support the resistance it employs only a fixed tubular bolt, a little larger in diameter than the opening of the cap, having inner threading, which is soldered upon the round opening of the cap, around the outer surface of the tubular bolt and upon the surface of the cap.

Instead of being soldered, the tubular bolt can be pressed upon its inner surface with a suitably formed cord and upon the outer surface of the cap opening of the heating apparatus with a suitably shaped rim. Another way of placing the tubular bolt on the cap opening is by hooking as follows: Four holed shoulders are soldered around the cap opening at a suitable distance and position. The lower part of the tubular bolt is formed to have corresponding holes or hooks. Thus the bolt is hooked unto the cap. The rubber flange is placed on the seat of the rim of the cap opening and then follows the metal flange with the electric resistance. Then tubular nut with its outer threading is screwed into the tubular bolt until it tightens the metal flange of the electric resistance. All the above mentioned are also tightened in this way. According to the demands of this invention, it is advisable that a suitable resistance be made.

Claims

1. A support mechanism of the electric resistance in the heater/boiler which consists of the cap 2, its rim (X) fig. 4, the tubular bolt bearing inner threading 7, the tubular nut with its outer threading 8, the metal flange 10. The mechanism is characterized by the fact that the support, the tightening and the waterproofing of the metal flange with the electric resistance 5 and the magnesium rod 6 is done with a mere screwing of the externally threaded tubular nut 8 with the aid of a metal rod through the opening 9.

2. According to claim 1, the support mechanism of the electric resistance for heaters/boilers is characterized by the fact that the tubular bolt 7 and the tubular nut 8 do not come into contact with the water of the heating apparatus. Therefore, no enamelling is needed avoiding thus such results as enamel cracking and in turn oxidation.

3. According to claim 1, the support mechanism of the electric resistance for heaters/boilers is characterized by the fact it can be assembled in three ways: a) with an external peripheral soldering onto the surface 11, fig.4. b) by four dowels, fig. 6., on the circumference of the cap 1, which bears corresponding sockets 4 on the lower circular surface 4 of the tubular bolt 2.and c) by buttoning the suitably formed cord 11, fig. 3, of the cap 2 with the corresponding formed cord 12 of the tubular bolt 7.

4. According to claim 1, the support mechanism of the electric resistance for heaters/boilers is characterized by the fact that the cord 11, fig. 1 serves as the seat of the rubber flange 10 as well as for the buttoning of the tubular bolt 7

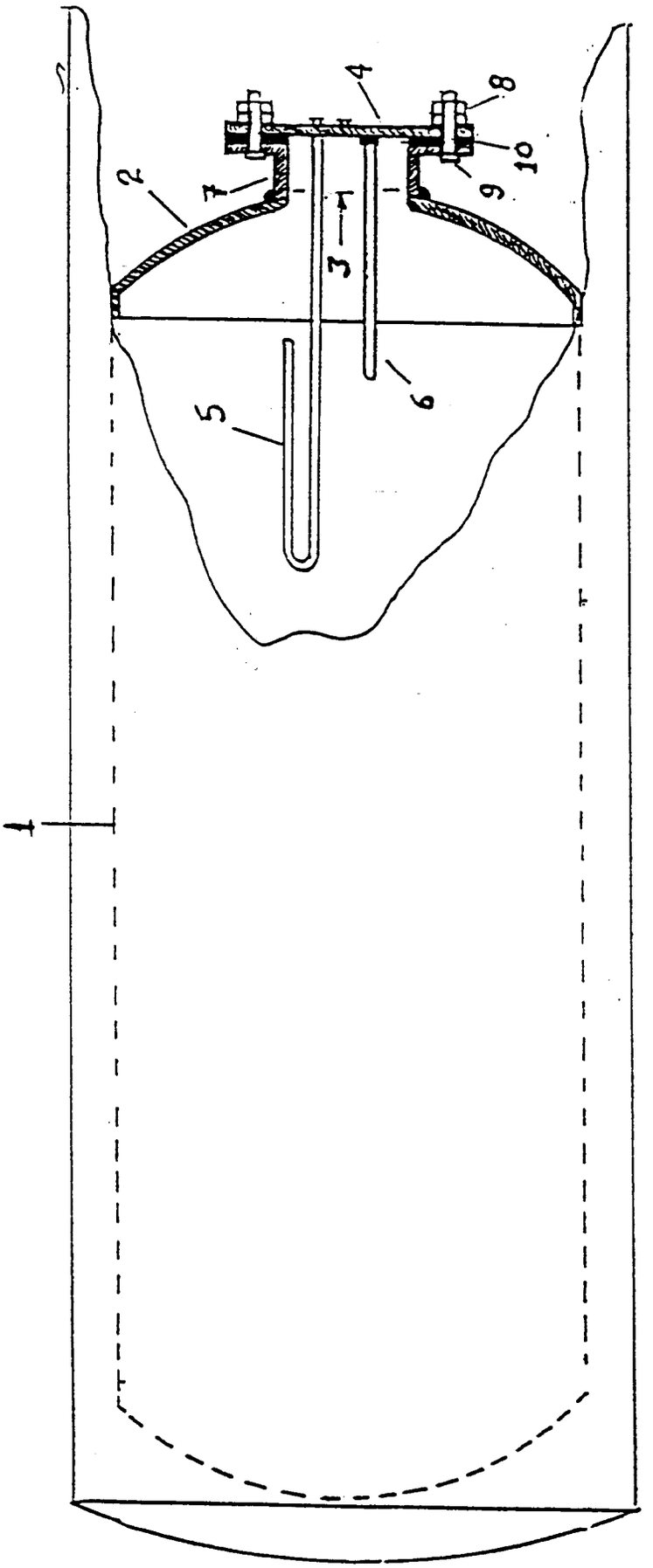


FIGURE 1

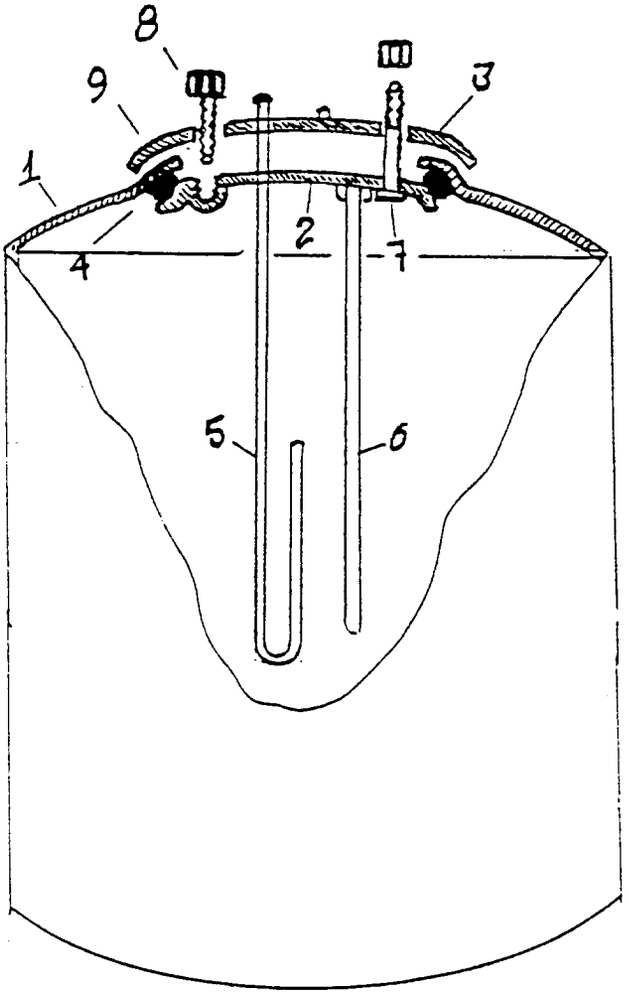


FIGURE 2

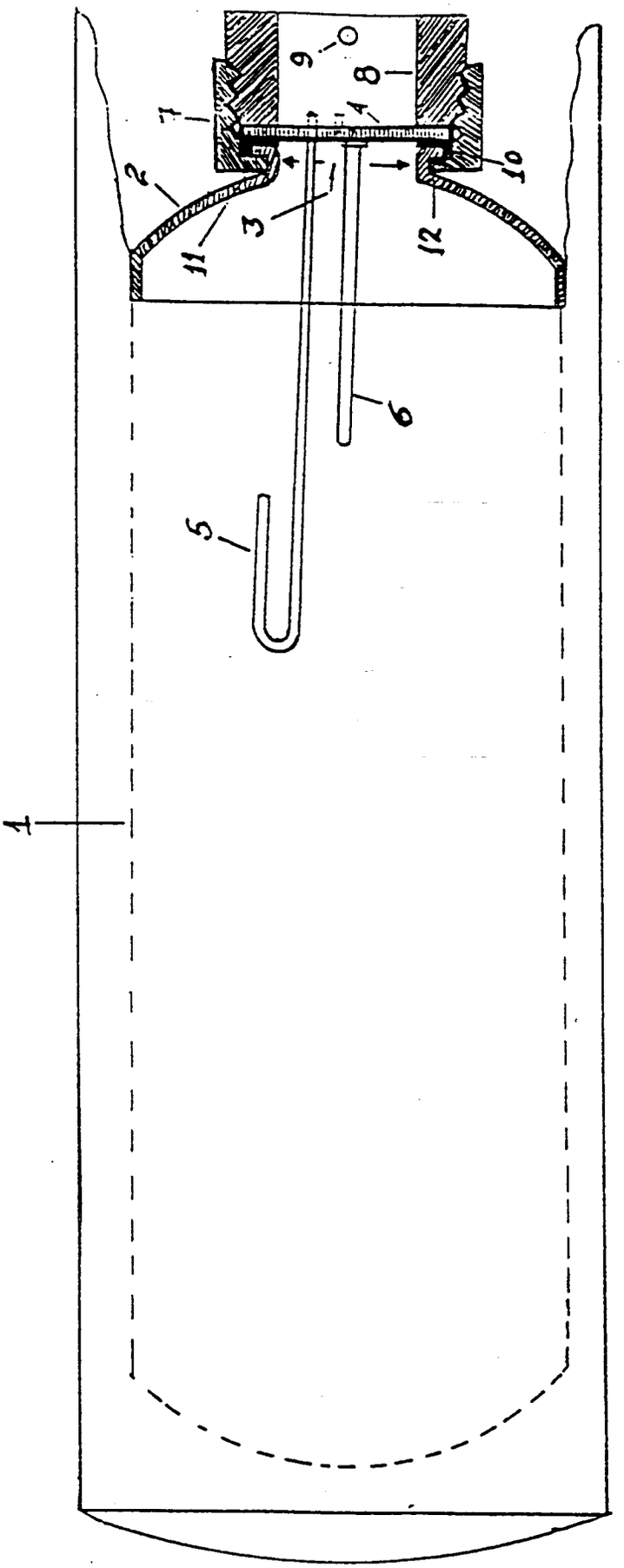


FIGURE 3

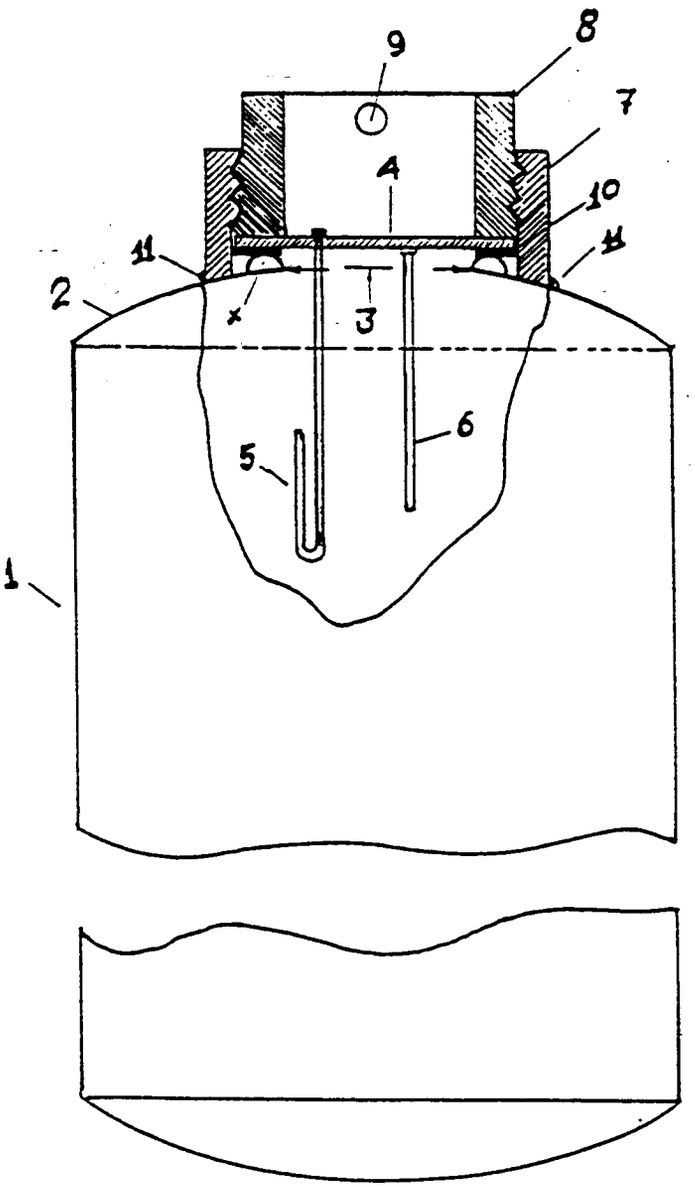


FIGURE 4 A

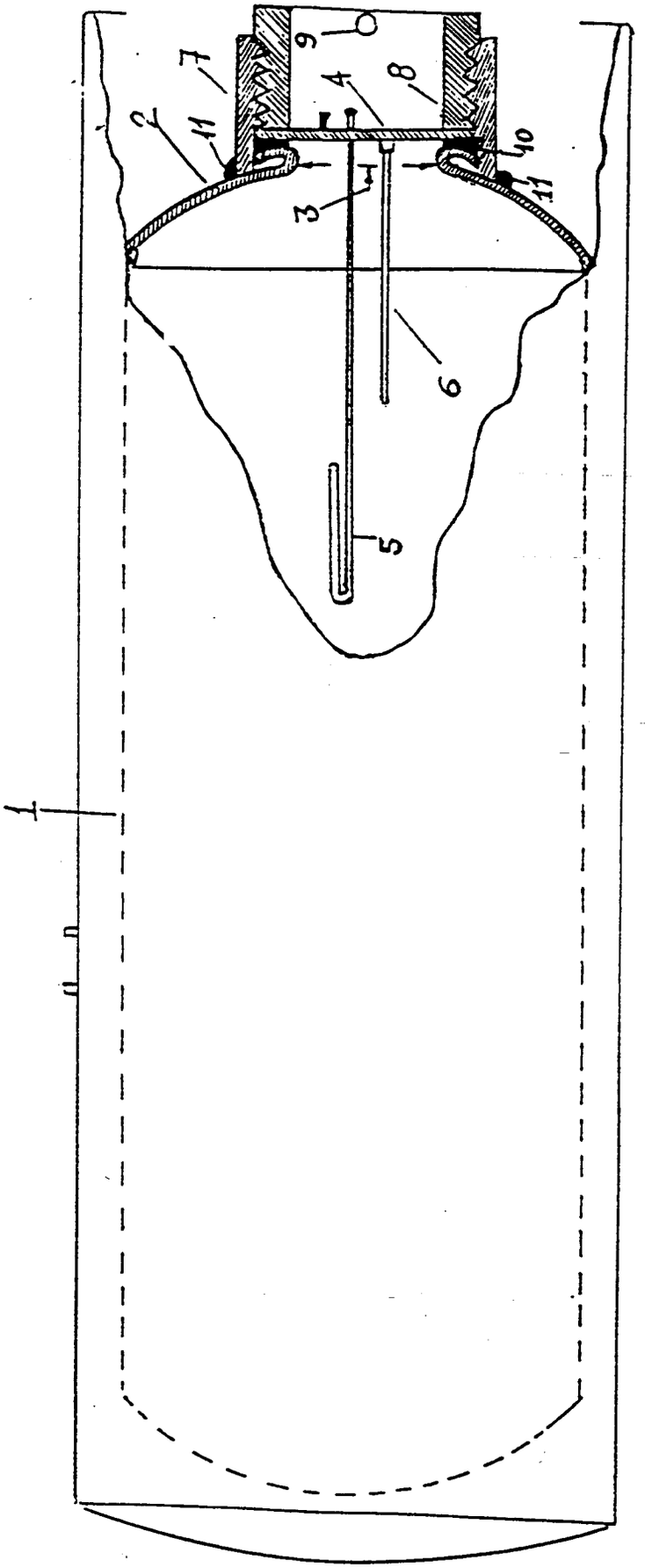
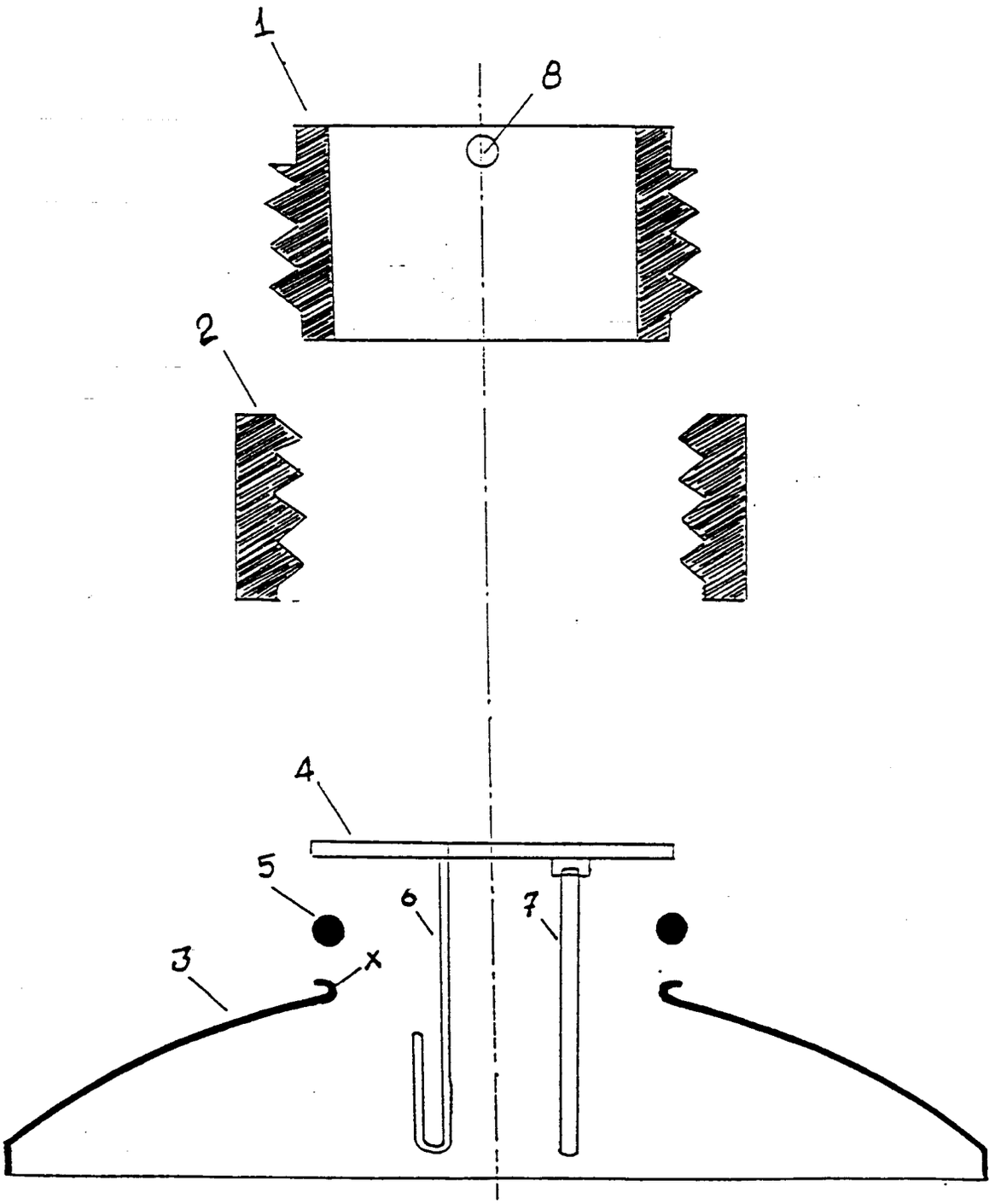


FIGURE 4.B

FIGURE 5



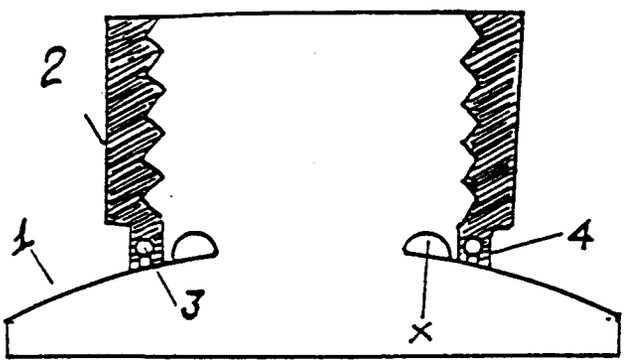


FIGURE 6