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AT CH DE FR GB LI(30) Priority: **05.06.1995 IT VA950009**(71) Applicant: **CUPPER s.r.l.****21100 Varese (IT)**

(72) Inventors:

• **Grotto, Romano****21056 Induno Olona (IT)**• **Riboli, Luigi****21020 Buguggiate (IT)**(74) Representative: **Pellegrini, Alberto et al****c/o Società Italiana Brevetti S.p.A.****Via Puccini, 7****21100 Varese (IT)**(54) **Adjustable chimney pot or turret for a chimney or ventilation conduit**

(57) A metal chimney pot or turret for a flue gas or vent duct is made of interchangeable parts that can be installed and assembled together without requiring the intervention of a bricklayer. A metallic basement plate (1), specifically shaped to suit the standardized type of tiles of the roof covering, is secured to the roof pitch and has an aperture defined by a tubular collar (3) ending with a truncated-sphere (4) or equivalently shaped portion. A metallic chimney pot (5) has a clamping flange (8) and an inner circular collar (9) suited to rest on the surface of the upper hemisphere of said end portion. Three or more tie-rods (10), engage said clamping flange to tighten the joint and block the chimney pot in a perfectly vertical alignment, regardless of the deviation from the true vertical of the axis of the tubular collar of the basement secured to the pitch.

The universality of the adjustable coupling between the base and the chimney pot permits an interchangeability of chimney pots of different shape and/or material. The alignability around 360°, permits the manufacture of standardized bases for the various types of standard tiles, regardless the actual slope of the roof.

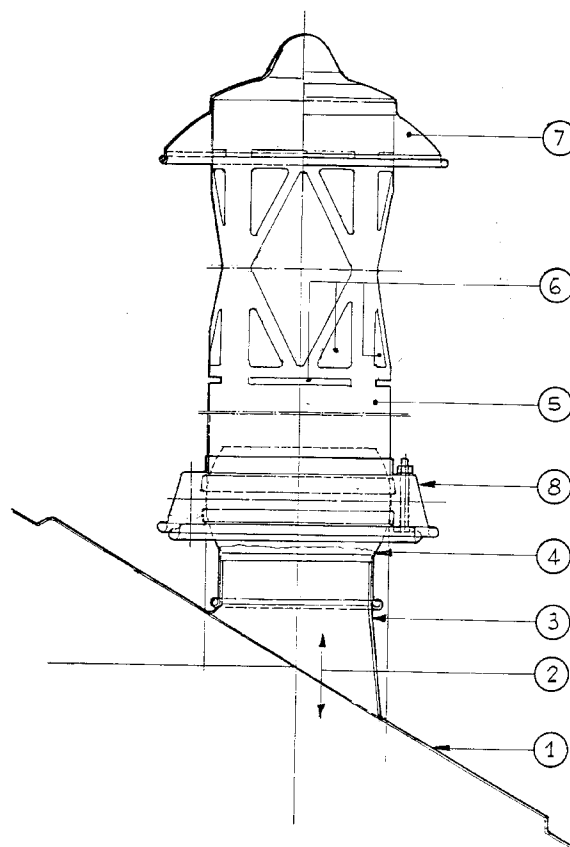


FIG. 1

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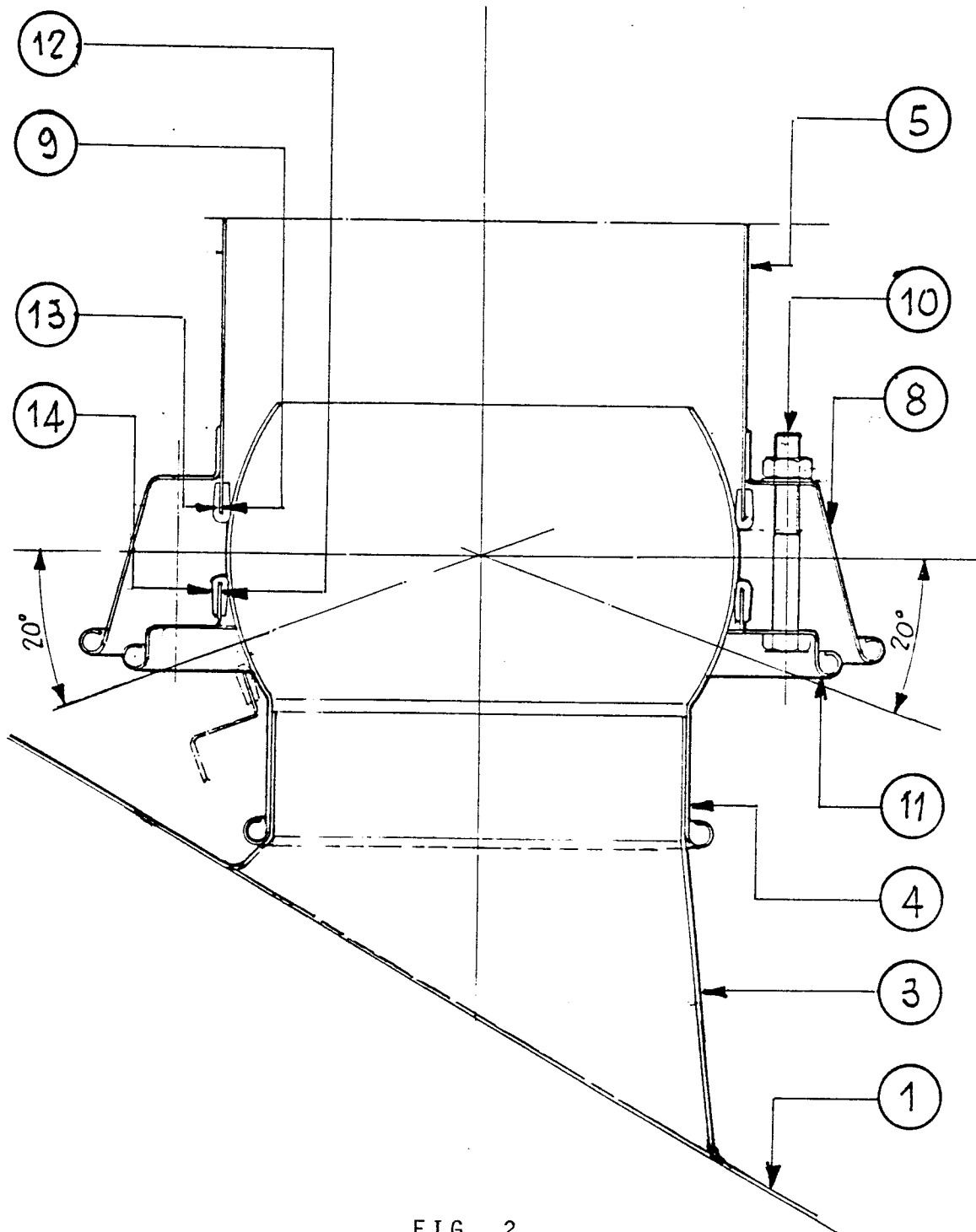


FIG. 2

Description

The present invention relates to a chimney pot or turret forming an exterior end portion of a chimney or air vent conduit to be installed on a roof top.

Chimney pots or turrets to be installed onto a roof top are often prefabricated pieces made of concrete or "coctile" because the costs involved are lower if compared to the costs of constructing it made on site with bricks. In the case of coctile prefab, the kit may comprise a base piece to suit the standard shape of tiles employed for covering the roof. In the case of chimney pots for the flue gas conduit of a heating system, typically of larger dimensions, the prefabricated kits are often of concrete, comprising a plurality of elements that can be assembled or concreted on site.

In any case, installing a chimney pot onto the roof necessarily requires a bricklayer because the prefabricated assembly is relatively heavy and must be correctly placed on a supporting wall and concreted in a perfectly vertical position in order to ensure stability of the chimney pot. The installation of a pitch covering may also be required around the passage of the chimney and/or the installation of a waterproofing sheath for safely draining rain water and avoid seepage.

These prefabricated chimney's pots and air vent turrets as well as brick chimneys are relatively heavy structures because their stability under stress conditions (for example strong wind) is ensured largely by the weight of the structure. Therefore, particularly heavy structures such as chimney pots of heating systems must be adequately supported by breast walls, typically external or perimetral walls or by pillars or posts purposely realized for their support. This limits the choice for the most favorable place of installation of the chimney pots.

There is a need or a clear usefulness of a lightweight chimney pot or turret that can be easily installed, that does not require to be set on a robust support structure and the work of a bricklayer for correctly positioning and concreting the chimney pot in place.

The object of the present invention fully satisfies these requisites providing for important advantages if compared to the known techniques.

The chimney pot or turret of the invention is an assembly composed of several components, all made of metal, preferably of sheet metal or alloy resistant to the conditions of exposure such as for example copper, stainless steel, aluminum, titanium or a lightweight alloy. The pot assembly has a relatively low weight and is perfectly bearable by a normal roof structure, without necessarily having to be set on a supporting wall or a similar supporting structure.

According to a first aspect of the invention, the chimney pot or turret is composed of a base or "chimney weathering" of a metal sheet of a lightweight alloy, shaped to coordinately fit and overlap the tiles of the roof covering. The base can be nailed or otherwise fixed to the "boarding" (wooden or bricked) of the roof pitch,

in such a way as to constitute a base shaped in function of the particular type of tiles of the roof covering. The base is provided with a circular opening defined by a standardized universal tubular collar having a substantially vertical axis (depending on the real inclination of pitch upon which the base rests).

The collar has an end portion shaped like a truncated-sphere.

In the present context reference will be made for simplicity to a truncated-sphere portion or shape, however it should be understood that this expression is not intended in a limitative way. As a matter of fact, the end portion may have the functionally equivalent shape of two truncated cones joined at their "bases". It is essential though that the shape be that of a surface of revolution forming a generally bulging shape having an upper and a lower hemisphere. Therefore with the expression "truncated-sphere" all these functionally equivalent shapes are intended.

This portion can be formed integrally to the collar and to the base plate that can be nailed on top of the pitch or may be a separately fabricated part that can be inserted on the tubular collar and fixed thereto it permanently for example by riveting welding or by the use of self-threading screws, bolts or pins.

A tubular terminal or chimney pot, preferably made of metal sheet, having outlets for gases, fumes and/or steams and a cap. The chimney pot has a coupling end standardized and thus substantially "universal". The coupling end of the turret or chimney pot may be provided with a preferably countersunk flange (skirt) amply overlapping at least partially the truncated spheric body of the base collar and internally provided with a circular seat or collar suited to rest onto the external surface of the truncated-sphere end portion of the base collar.

In this way, different bases (plates with the tubular collar) may be manufactured to suit different standard of roof tiles, while their truncated-sphere collar is substantially universal thus allowing the coupling thereon of a metal sheet terminal which in turn can be selected among a variety of types, all having a circular seat or inner circular collar substantially identical. The tubular collar of the base, ending with said truncated-sphere portion may have an axis incident on the plane of the base plate at a certain angle, for example of 60°. Despite of this, the base can be installed on roof pitches with inclinations varying from a minimum of approximately 10° to a maximum of about 50° or even steeper. Onto the fixed base can be mounted a chimney pot that may be selected among differently shaped pots all having a universal coupling seat. The spherical surface coupling permits to adjust the pot to align it into a perfectly vertical position, regardless of the deviation from the true vertical of the axis of the collar of the base plate secured to the pitch boarding.

The coupling between the circular seat or inner collar of the coupling end of the chimney pot and the spherical surface of the truncated-sphere terminal of the

basement's collar allows in practice to azimuthally adjust the position of the pot for 360°, essentially without any limitation.

Three or more tie-rods may be tightened to tighten together the circular seat or internal collar at the coupling end of the metal sheet cowl and the external spherical surface of the truncated-sphere terminal portion of the collar of the basement, thus blocking in a perfect vertical position the chimney pot or turret.

According to an aspect of the invention, the cowl or chimney pot of metal sheet is provided at the coupling end with a countersunk flange, shaped like "skirt" that abundantly covers the zone where the circular inner collar or seat bears on the spherical surface of the truncated-sphere collar of the basement. The countersunk flange may extend down to cover even a substantial part of the collar of the base. The visible result is such that a viewer sees the chimney pot turret rising upward from the inclined pitch of the roof in a perfectly vertical position.

The circular inner seat or collar present at the coupling end of the chimney pot of metal sheet may have a conical surface suited to bear on the external spherical surface of the truncated-sphere end of the basement's collar. Such a conical surface may be formed for example by folding inwardly the metal sheet or by rolling the edge of the metal sheet to countersunk it. In this way the tightened abutment joint retains a certain resilience that ensures the maintaining of a secure tightening even through temperature variations.

Moreover, the use of identical materials for fabricating the truncated-sphere portion of the collar of the base and the pot or at least its inner circular collar, for example with copper or stainless steel sheet, ensures an identical thermal expansion of the two bodies tightened together.

In addition or as an alternative, the rest surface of the circular inner collar may be provided with suitable packing compensating for any eventual differences of thermal expansion of the assembled parts tightened by the tie-rods.

The tie-rods may be secured to the base plate which is fixed to the pitch of the roof, or more preferably an annular counterflange may be mounted in the "throat" defined between the tubular collar raising from the base plate and its truncated-sphere end portion. In this way the surface of the base plate on which rain water drains down remains perfectly clear of obstructions that may retain wind blown leaves and debris.

The various aspects and advantages of the invention will become even clearer through the following description of some important embodiments and by referring to the attached drawings, wherein:

Figure 1 is a general assembly view of a chimney pot or turret of the invention;

Figure 2 is an enlarged partial sectional view showing the universal orientable joint according to a first

embodiment of the invention;

Figures 3 and 4 show an alternative embodiment of the orientable joint.

By referring to Figures 1 and 2, the chimney pot or turret of the invention comprises a plate or metal base 1 having a hole or central opening 2 defined by a tubular collar 3 ending with a portion shaped like a truncated-sphere 4. The plate 1, the tubular collar 3 and eventually also the truncated-sphere terminal portion thereof 4 may all be made of metal sheet or cast in one piece with a lightweight alloy. Preferably the base plate 1 and the tubular collar 3 are made of welded or riveted metal sheet while the truncated-sphere terminal portion may be of metal sheet, forcibly inserted over the tubular collar 3 and permanently secured to the collar by welding, or riveting, or by the use of self-threading screws, bolts or pins.

The base plate 1 is manufactured with a specific shape, suited to match with and overlap the tiles of the roof covering so as to guarantee a leak free coverage of the pitch of the roof. In practice, the base plate 1 matches perfectly the particular type of tiles for which it is purposely constructed thus ensuring a perfect continuity of the roof covering about the aperture of the pitch required for the installation of the chimney pot.

The axis of the tubular collar 3 of the standardized base plate 1 is oriented at a certain preestablished angle in respect to the plane of the plate 1, in consideration of an average pitch inclination for example of 30°.

Moreover, the basement of the chimney pot, constituted by the plate 1, the tubular collar 3 and its truncated-sphere terminal 4, regardless of the type of shaping of the plate 1 strictly predisposed for a determined type of tiles, constitutes substantially an element having standardized characteristics of "universal" use on pitches of any inclination, as detailed hereinbelow. This constitutes an important aspect of containment of costs.

The base plate of metal sheet 1, can be securely fixed to the pitch boarding, in case of a wooden roof, or to the surface of a bricked pitch by the use of nails, expansion fasteners, bolts or the like.

The chimney pot or turret 5 may have different forms to suit different functional or aesthetic requirements and is functionally provided with vent conduits 6 and a top pot 7. All pots 5 are generally provided with a skirt-like countersunk flange 8, extending down to mask the truncated-sphere end portion 4 of the base's collar. Internally of said countersunk part 8, the pot 5 is provided with a circular collar 9 whose diameter is standardized such that the pot may rest on the external spherical surface of the truncated-sphere portion 4.

A plurality of tie-rods 10, at least three, engage with the skirt-like flange 8 of the pot 5 and allow to tighten in a correctly aligned supporting position the inner collar 9 of the pot 5 on the external spherical surface of the truncated-sphere portion 4 of the base, regardless of the

orientation that may generally not be vertical of the axis of the base's collar 3 (which depends on the actual inclination of the pitch upon which the base is fixed).

As will be obvious to a technician skilled in the art, the tie-rods 10 that join the baseplate 1 to the chimney pot 5 may, according to a preferred embodiment illustrated in the figures, act on an annular counterflange 11, that can be made of a metal sheet and provided with a tubular collar 12 suitable of forcibly engaging against the external surface of the lower hemisphere of the truncated-sphere end portion 4.

The abutment surfaces of the tubular collars 9 and 12 may be provided with a packing 13 and 14 of a resilient material, sufficiently resistant to the temperature of vented flue gas and/or vapors.

More preferably, as shown in the Figures 3 and 4, the abutment surface that constitutes a seating surface of the circular collar 9 and eventually also the circular collar 12 of the annular counterflange 11, may be realized by rolling the metal sheet to countersink it thus forming substantially conical surfaces bearing against the external spherical surface of the truncated-sphere portion 4. This way of forming the seating surfaces impart a certain resilience to the joint, sufficient to compensate eventual differences of thermal expansion among the tightened parts, besides ensuring a proper sealing of the junction between the basement and the chimney pot.

The advantages of the chimney pot or turret of the invention are evident. In the first place, the relatively lightweight of the assembly, entirely constituted of a metal sheet (or partially of a lightweight alloy), allows to place the chimney pot or turret anywhere on the pitch, even far away from supporting walls. Assembling may be carried out with extreme simplicity without requiring the intervention of a bricklayer. The special spherical joint allows to align the chimney pot in a perfectly vertical position, regardless of the actual slope of the roof pitch, on which the basement is secured. Moreover, the countersunk skirt-like end of the metal sheet pot disguises the joint and partially the tubular collar raising from the base plate, so way that a distant viewer sees just a perfectly vertical chimney or vent turret.

The chimney pot besides being easily aligned and secured to the basement, may as easily be disassembled and reassembled to facilitate inspection maintenance and cleaning of the flue gas or vent duct.

The universality of the pot-anchoring joint, adjustable around 360°, permits an interchangeability of pots, which may be selected among a variety having functional and aesthetic characteristics to suit different installation requirements. On the other hand, the availability of standardized basements, specifically shaped to suit a certain standard type of roof tiles, eliminates the need to verify and ensure by appropriate means a correct drainage of rain water down the pitch of the roof. In practice the base plate coordinates itself with the adjacent tiles to ensure a substantial continuity of the roof cover-

ing.

Claims

1. A chimney pot or turret assembly for a flue gas or vent duct, characterized in that it comprises

a metal plate specifically dimensioned and shaped in such a way as to coordinate itself with the particular standardized tiles of the roof covering, fixable on the pitch of the roof and having an aperture provided with a tubular collar ending with a truncated-sphere or equivalent solid of revolution portion;

a metal sheet pot having an outer clamping flange and an inner circular collar resting on the external surface of the upper hemisphere of said portion;

tightening means capable of forcing the seating of said inner circular collar onto the external surface of said upper hemisphere of said portion to block the pot in a perfectly vertical alignment regardless of the deviation from the true vertical of the axis of said tubular collar.

2. The chimney pot or turret as defined in claim 1, characterized in that said inner circular collar has a conical rest surface and sufficient resilience to compensate differences of thermal expansion among the tightened metal parts.

3. The chimney pot or turret as defined in claim 1, characterized in that said inner circular collar has a resilient packing dispersed on the surface resting on the surface of said upper hemisphere.

4. The chimney pot or turret as defined in claim 1, characterized in that said tightening means comprise at least three tie-rods engaging said outer clamping flange.

5. The chimney pot or turret as defined in claim 4, characterized in that said tie-rods are secured to an annular counterflange that can be tightened against a lower hemisphere of said end portion.

6. The chimney pot or turret according to claim 5, characterized in that even said annular counterflange has an inner collar being on a surface of said lower hemisphere.

7. The chimney pot or turret according to any of the preceding claims, characterized in that said clamping flange has a skirt-like portion extending down to mask the joint zone of said tubular collar.

8. The chimney pot or turret according to any of the preceding claims, characterized in that said metal plate and said tubular collar are of a metal sheet and said truncated-sphere or equivalently shaped portion is also of metal sheet and solidly fastened to said tubular collar by means of fasteners or by welding or riveting. 5
9. The chimney pot or turret according to claim 8, characterized in that it is entirely constituted of a copper. 10

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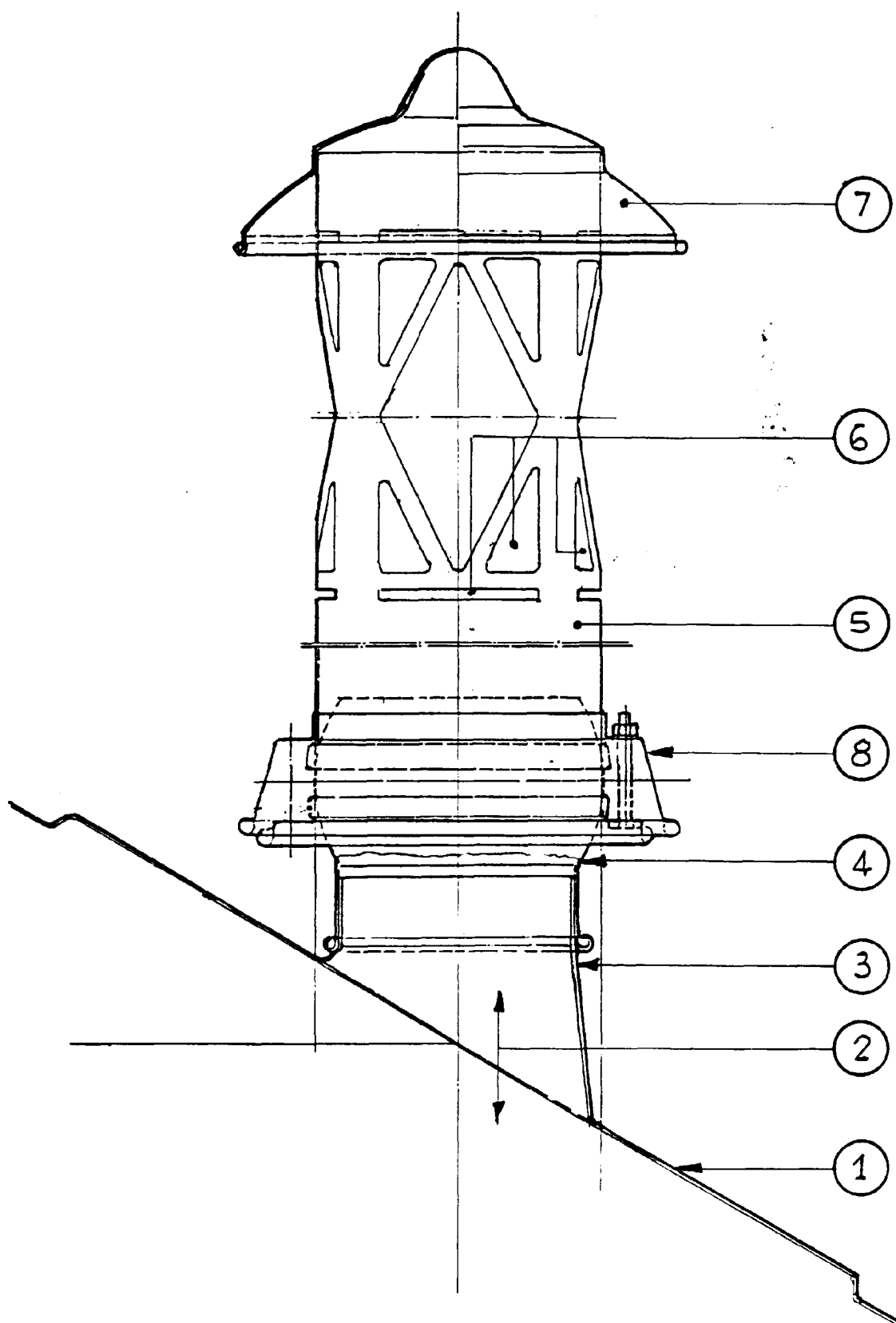


FIG. 1

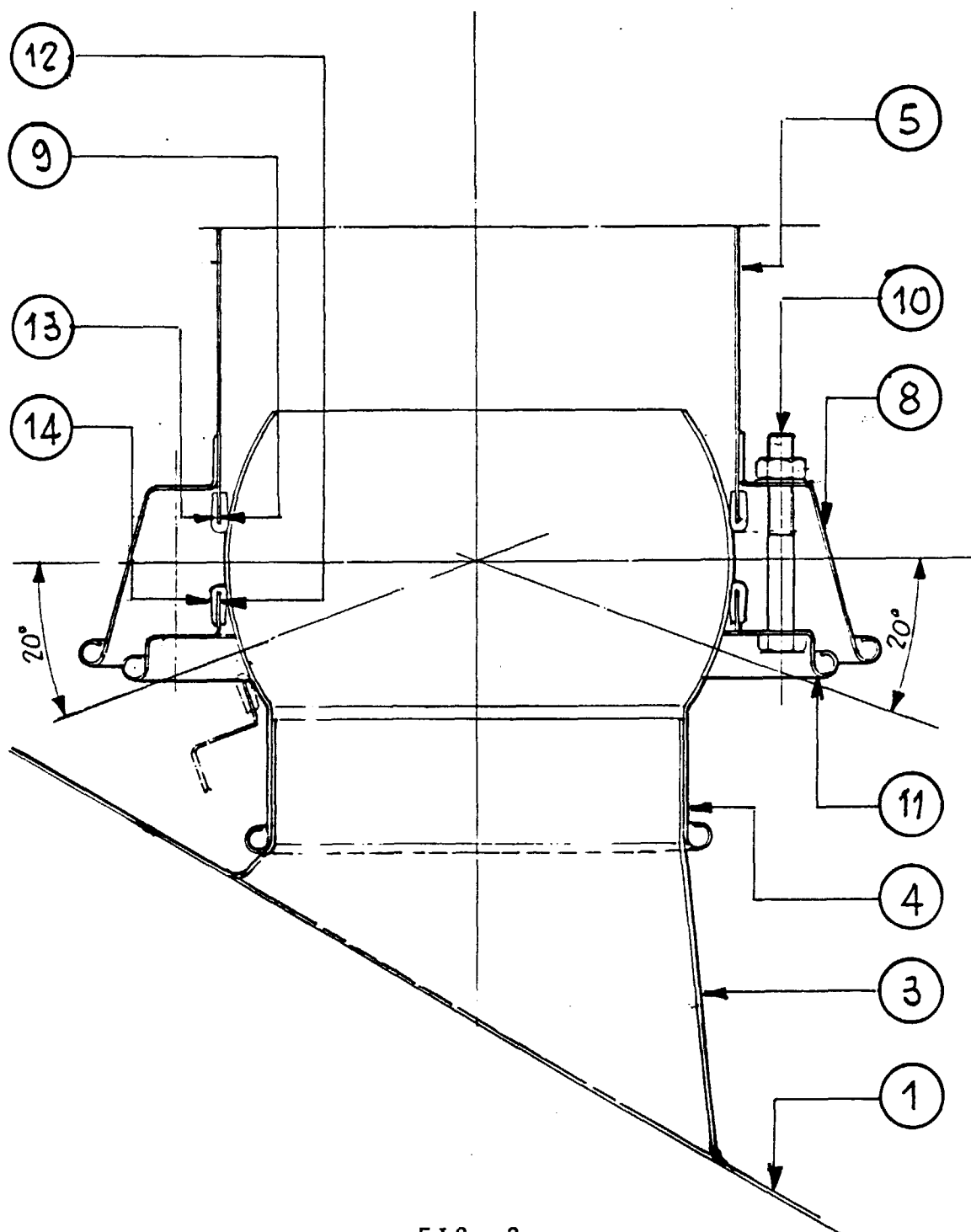


FIG. 2

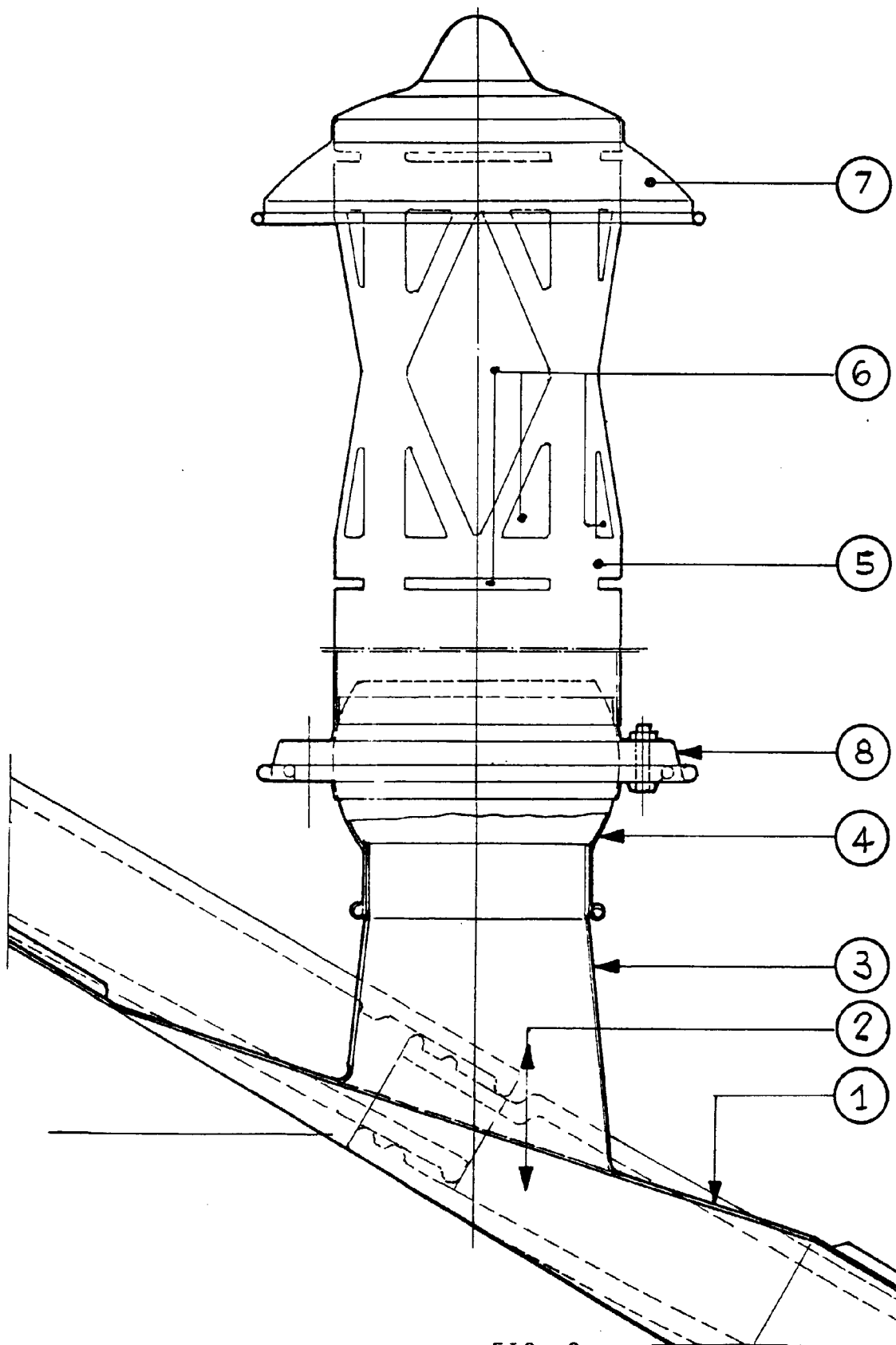


FIG. 3

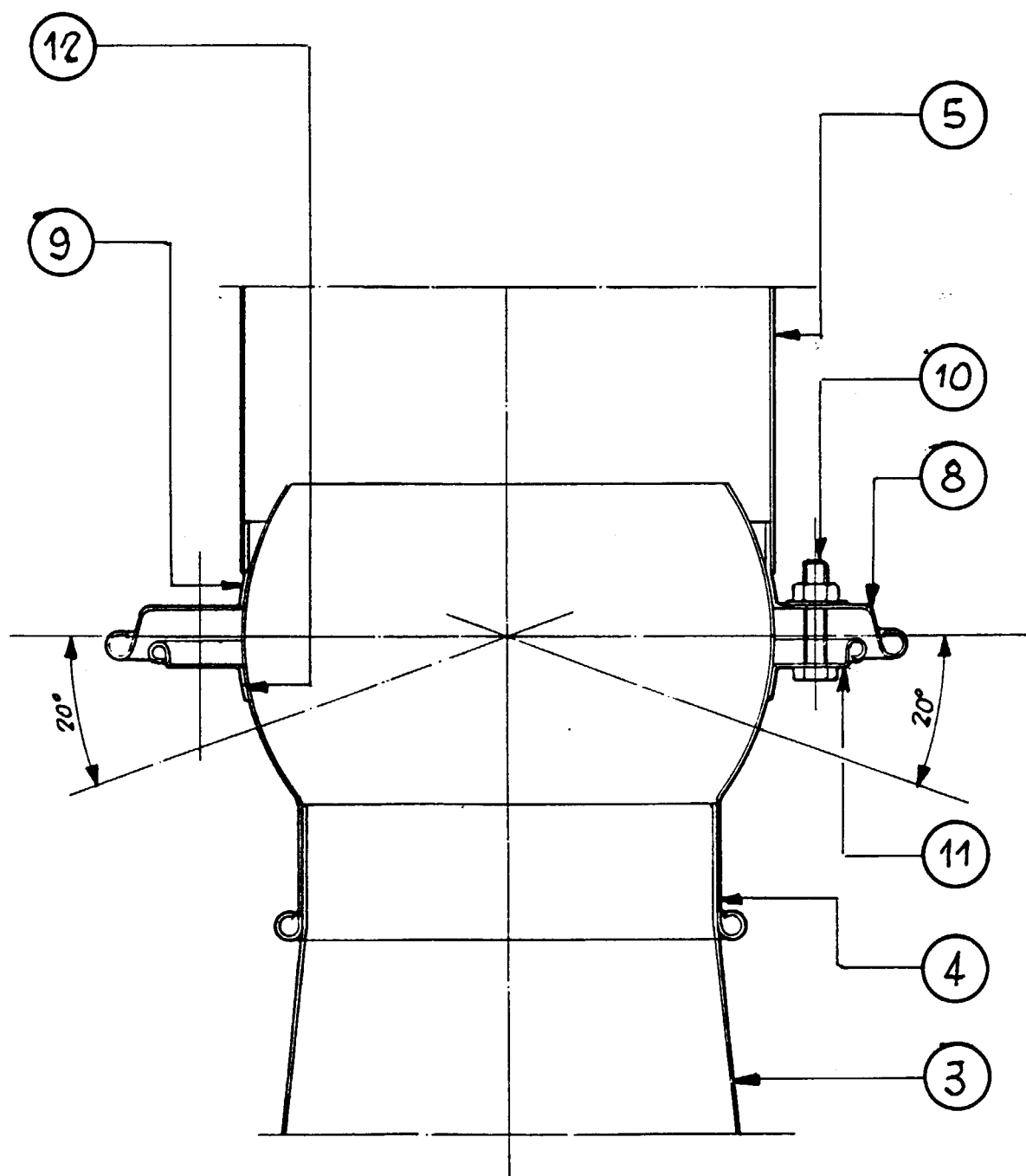


FIG. 4