

12

EUROPEAN PATENT APPLICATION

21 Application number: **87500027.5**

51 Int. Cl. 4: **F 22 B 37/22**
F 16 L 55/10, G 21 C 13/06

22 Date of filing: **21.05.87**

30 Priority: **22.05.86 ES 555236**

43 Date of publication of application:
25.11.87 Bulletin 87/48

84 Designated Contracting States: **BE DE FR SE**

71 Applicant: **EMPRESARIOS AGRUPADOS, S.A. DE**
EPRESAS
Magallanes, 3
Madrid (ES)

72 Inventor: **Fernandez Iglesia, Fernando**
Bravo Murillo, 95-A, 206
E-28003 Madrid (ES)

74 Representative: **Toro Gordillo, Ignacio Maria**
Viriato, 56
E-28010 Madrid (ES)

54 **Mounting system for towel closures in tanks and reservoirs.**

57 The invention refers to a mounting system especially designed for towel closures in tanks and reservoirs, which has the purpose of easing the transport of the elements which make up the closure until the place of definitive location, as well as to minimize the time of mounting, and centers its characteristics in the combined use of a folding framework, and a framed modular cover which, under folding situation adopts an enlarged configuration which, together with the modulation of the cover, reduces the effective volumetry of the assembly, said framework counting on means of rapid coupling for the modules of the cover, which modules are provided with intercoupling means which establish a pre-determined and exact relative position among them, whilst at the same time the framework is provided with linking means initially hinged to the nozzle of the towel, prior to the mounting of the modules or segments of the cover.

Description

MOUNTING SYSTEM FOR TEWEL CLOSURES IN TANKS AND RESERVOIRS

OBJECT OF THE INVENTION

The present invention refers to a mounting system especially designed for tewel closures in tanks and reservoirs, with which system are attained two fundamental objectives, on one side, that the elements which make up the closure be easily moved from the outside up to the point of location of the tewel, with pieces of a relatively reduced weight and which besides allow their free path by "man-holes" existing at the installation, which in many cases have an amplitude smaller than that of the very tewel in which the closure is to be located, and on the other side, that the mounting operations may be carried out in an utmostly rapid mode, minimizing the time of exposure of the operator to the effects of the environment existing in the reservoir.

ANTECEDENTS OF THE INVENTION

As it is known, the very nature provided for the closure and the size of the tewels to be closed causes that, in many cases, the closure cover makes up an object of a considerable weight, requiring several persons for its handling, to which it must be added, besides, as previously stated, that in many installations there are tewels which diameter and in consequence the closure cover shows a magnitude higher than those of the manholes located to accede to the area of location of the tewel.

On the other hand and as it is also evident, on the cited tewels as it happens for instance in the tewels of the primary of the generators of the stream in a nuclear plant, there exists a radioactive environment which forces to minimize as much as possible the stay of the operator who is to perform the mounting, in this area, with the evident objective of minimizing at the same time the risk of his being affected by such a radioactive environment.

DESCRIPTION OF THE INVENTION

The system which the invention proposes has been especially designed to solve this problem at full satisfaction, in its different vertients and is based in the establishment of a modular structuration for the closure elements, which ease their handling and transport, as each of such modules offers a volumetry and weight considerably smaller than those of the closure element in its whole, and that together with a great ease and promptness of mounting for said modules, up to the point that the time of installation does not exceed the three minutes, all of it, obviously, together with some optimal functional provisions for the system, once implanted in the tewel.

Therefor and in a more concrete mode, the system preconized is based, as previously stated, in the modular structuration of the cover that makes up the closure, preferably on basis of three pieces, though obviously this number will be variable according to the sizes and global characteristics of the specific closure in each case, being it provided means of

joined-up coupling to such pieces or segments which allow their prompt mounting on a foldable framework, which adopts an en larged configuration under transport situation, and opens up in a practically instant mode, thus being adapted to the configuration of the corresponding tewel.

In a more concrete mode, said framework is made up by several symmetrical arms, being every two arms adjacent in-between joined through a couple of connecting rods, articulated, which allow the adaptation of one over the other or their side separation up to a certain limit situation. In this way all the arms of the framework remain laterally united during the transport of same, said framework offering an enlarged configuration of little width, as from which and after its coupling to the tewel, as hereinafter seen, said framework may be expanded laterally until affecting the whole nozzle of the cited tewel.

Specifically the central arm of the cited framework is riveted on one of its ends into an articulated linking hinge, which is joined to a small support which in turn is fastened to the flange of the tewel by means of bolts provided with a rapid coupling system, of the bayonet type.

These arms of the framework, at their bottom face, incorporate a series of appendixes, as a hook, in which are susceptible of a successive coupling the various modules or segments of the very cover, each of which shows joined-up coupling means to the adjacent ones, materialized in shafts and complementary holes, so that this joined-up coupling is attained simultaneously with the very implantation of such segments over the framework.

The last segment to be installed will duly incorporate solidary to same, a diaphragm or membrane, with which it will be attained the tightness of the closure and which, after the implantation of this latter segment on the framework, will be duly coupled to the rest of the segments that make up the cover, acting the very diaphragm as a union link on the side between same.

This mounting having ended, it will be enough with taking down the framework-modular cover assembly over the nozzle of the tewel, and finally proceed to the definitive fastening of the framework to the latter, by means of bolts similar to those used for the anchoring of the support of the hinge and located at the free ends of each of the arms that participate in the structure of such a framework.

From the structuration described it is deduced the ease of transport not only for the framework but also for the modules or segments of the cover, the easy, practically instant transformation of said framework towards the operative situation on the tewel and as well the easy and prompt implantation on the framework of the various segments that make up the closure cover which, due to the existence of the joined-up means that relate them, remain perfectly aligned and interrelated.

DESCRIPTION OF THE DRAWINGS

To complement the description being made and in order to help to a better understanding of the characteristics of the invention, it is enclosed to the present specification, as an integral part of same, a set of drawings in which with an illustrative and not limitative character, the following has been represented:

Figure 1.- Shows a plan view of the framework which participates in the mounting system for closures of tewels in installations of nuclear plants which makes up the object of the present invention.

Figure 2.- Shows a plan view of the same framework, which now appears in an operative or extension situation.

Figure 3.- Shows a profile of the said framework.

Figure 4.- Shows a modular profile piece division of the segments that make up the closure cover.

Figure 5.- Shows a profile of the membrane or diaphragm which cooperates with the segments of the previous figure in the conformation of the cover.

Figure 6.- Shows the first mounting sequence with the system preconized and in accordance with an example of practical performance, in which the closure is intended to the tewels of the primary of the generators of steam of a nuclear plant.

Figure 7.- Shows a view similar to that of the previous figure, after the implantation of the framework.

Figure 8.- Shows the same view after the coupling to the framework of the first segment of the cover.

Figure 9.- Corresponds to the following sequence, in which there appears coupled the second segment of the cover.

Figure 10.- Shows again the same view, now with the cover fully mounted and in phase of adaptation to the various segments of the membrane solidary to the last of them.

Figure 11.- Shows, as per a view similar to that of the previous figures, the same assembly with the cover perfectly finished, fastened to the framework and in take down situations, together with the latter, over the corresponding tewel.

Figure 12.- Shows, finally, a view of the anchoring system provided between the framework and the tewel.

PREFERENT EMBODIMENT OF THE INVENTION.

On view of these figures, it can be seen how the mounting system for tewel closures preconized is based in the use of a foldable framework made up of a central arm (1) and two couples of side arms (2-3-2'-3') being all these arms joined in-between through couples of articulated connecting rods (4), being all these arms, through the cited connecting rods, capable of adapting each other as shown in figure 1, determining a minimal volumetric occupation for the transport of same, or being extended in a

way that the ends of such arms (1-2-3) remain located over an imaginary circumferential trace (5), dimensionally coincident with the nozzle of the tewel.

The very cover or closure is made up by means of a plurality of segments (6-7-8) as shown by figure 4, provided in their adaptation partitions with small shafts (9) which, passing through holes operatively made in the adjacent modules, determine the joined-up coupling between them, in a mostly rapid and simple mode, and with a correct and specific relative positioning between them.

These modules (6-7-8) are intended to be fastened to the framework (1), after the fastening of the latter to the nozzle of the tewel, to which purpose such a framework incorporates on its faces of reception of such segments, small appendixes in the mode of hooks (10) which facilitate such a coupling.

The very cover or closure is complemented with a membrane (11), which is kept unmovably fastened to one of the segments, concretely to the segment (8) which is to be implanted over the framework (1) in the last stage.

The central arm (1) of the framework, on one of its ends and with the cooperation of a hinge (12), is joined by articulation to a small support (13), transverse, provided with holes (14) at its ends for its fastening to the nozzle of the tewel, previously to the coupling of said framework of the modules which make up the cover, counting, besides, all the arms (1-2-3) on the framework on their ends, with other holes (15) for the definitive fixation to the tewel of the assembly, after the mounting of the cover, as will be seen later on.

In accordance with this structuration the mounting is started with the temporary disposition on the nozzle (16) of the tewel, of an element of protection (17) which sets forth an also temporary closure of same. Afterwards and after the adequate transport of the framework (1), and of the modules or segments which make up the cover, near the tewel, which is easily performable due to its modularity, that is, due to the reduced weight and volume of each of its elements, the support (13) is fastened to the nozzle of the tewel, so that the framework (1) in its whole is susceptible of tilting with respect to such a nozzle, situated in the position shown in figure 7, under which it remains under the conditions of receiving, by simple coupling, to the first segment (6) of the cover, as shown in figure 8, afterwards to the second segment (7) of the cover, as shown in figure 9 and finally to the third and last segment (8) of the cover, as shown in figure 10, which segment bears the membrane (11), which will be adapted to all the modules or elements that integrate the cover, as in turn is shown in figure 11.

Immediately after the take down of the framework-cover assembly takes place, in accordance with the arrow shown in figure 11, until this assembly is coupled to the nozzle of the tewel, at which time the fixation of such an assembly is complemented, concretely through the end holes (15) of each of the arms that participate in the framework.

This fixation is also carried out in a mostly rapid and simple mode, concretely with the cooperation of

bolts (18), shown in detail in figure 12, and which by means of a system of bayonet are coupled to bushings (19) duly implanted in the sine of the flange (20) which normally the nozzle of the tewel is provided with, or to devices designed to that purpose in case the tewel has not a flange available.

This way it is obtained an easy transport of the elements which participate in the closure of the tewel, up to the area of implantation of same, that is, until the cited tewel, as well as a latter and rapid mounting of same, with a real time of installation which does not exceed 3 minutes.

It must also be highlighted that this mounting system admits deviations in the real position of the drills of the flange (20), as well as deviations in the real profile of the tewel, which consequently cooperates fundamentally to facilitate the mounting process.

Finally, it must be cited that, within a preferent example of practical embodiment for the mounting system, the arms of the framework will be obtained in aluminium, to lighten its weight, whilst the hinge, the axles and bolts will be of steel, like the bushings inserted in the flange, for the coupling by bayonet of said bolts, being the membrane obtained in the most ideal material to attain the tightness pursued through same.

Claims

1.- Mounting system for tewel closures in tanks and reservoirs which, having the purpose of easing the transport of the elements which make up the closure until their place of definitive location and of minimizing the time necessary for said mounting within margins reducing to the maximum the risk for the operator versus the effects of the environment of the area, is essentially characterized in that it is based in the combined use of a flodable framework and a cover or modular closing element, assisted by the corresponding tightness membrane, in a way that said framework under folding situation, adopts an enlarged configuration, which reduces its volumetry, the same as the modulation of the cover reduces the effective volumetry of each of its parts and having it been provided that said framework counts on means for the rapid coupling of the segments that make up the cover, that such segments count at the same time on means of intercoupling, which establish the relative exact position among them, that the framework be provided with means of link, initially hinged to the nozzle of the tewel, prior to the mounting of the segments of the cover, and of a definitive unmovable fixation to such a nozzle of the tewel, after the mounting of the modules of the cover and its corresponding membrane.

2.- Mounting system for towel closures in tanks and reservoirs, as per the previous claim, characterized in that the framework is made up as from a plurality of arms, articulately linked

two to two, with the cooperation of couples of connecting rods, which central arm is joined at one of its ends and through a hinge, to a small fixation support to the nozzle of the tewel, whilst at the other end of this arm and in both ends of the remaining arms, are located holes for the integral fixation of the support of the tewel, after the mounting of the cover.

3.- Mounting system for tewel closures in tanks and reservoirs, as per the previous claims, characterized in that the modules which make up the cover are provided with, at their faces of side adaptation, means joined-up, which establish their right relative positioning, whilst at the face of the framework which corresponds to the reception of such modules are established small appendixes like hooks, which allow the coupling to the framework of such segments.

4.- Mounting system for tewel closures in tanks and reservoirs, as per the previous claims, characterized in that the tightness membrane is solidarized to the last module of the cover, which are fastened to the framework, as from which mounting is established the definitive fixation of same to the rest of the modules, by simple coupling to the surface of same.

5.- Mounting system for tewel closures in tanks and reservoirs, as per the previous claims, characterized in that the means of rapid coupling to the nozzle, not only at the beginning of the small hinged support to the framework but also after the mounting of the cover of all of them to each of the arms of said framework, consist in bolts which cross holes of said support and arms, and which are coupled by bayonet or any other type of bolt in the sine of bushings, operatively set forth in the flange located in the nozzle of the tewel, or in other devices designed to that purpose.

6.- MOUNTING SYSTEM FOR TEWEL CLOSURES IN TANKS AND RESERVOIRS.

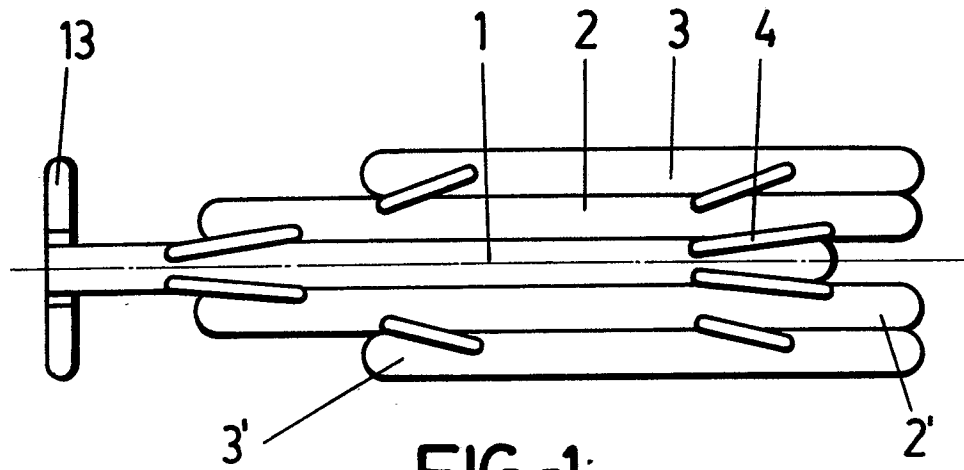


FIG.-1

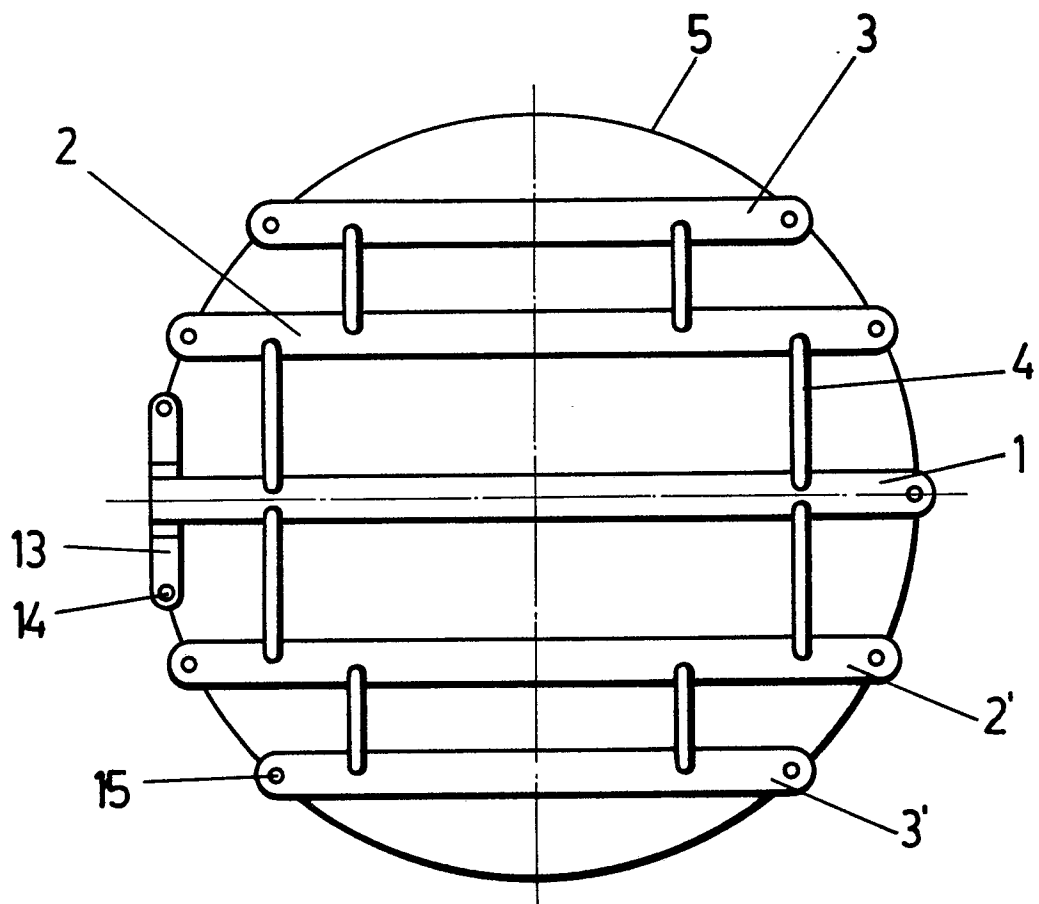
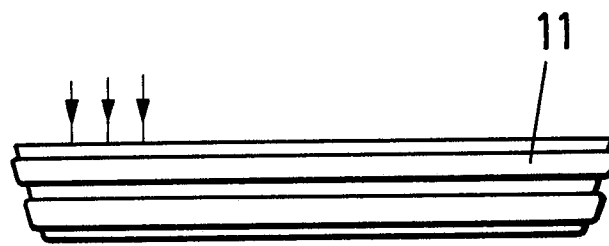
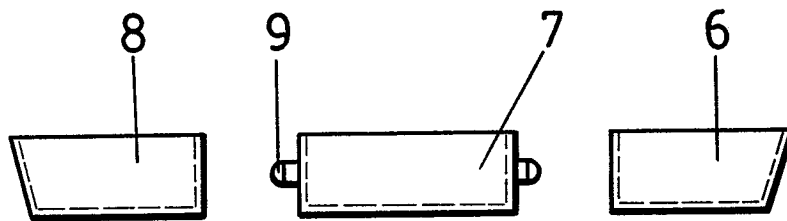
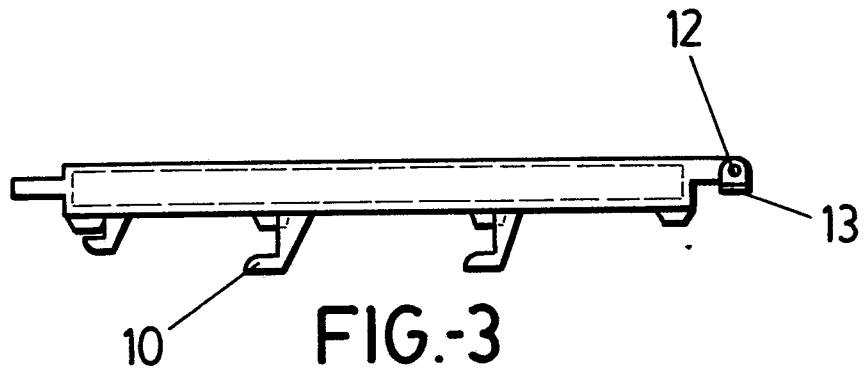
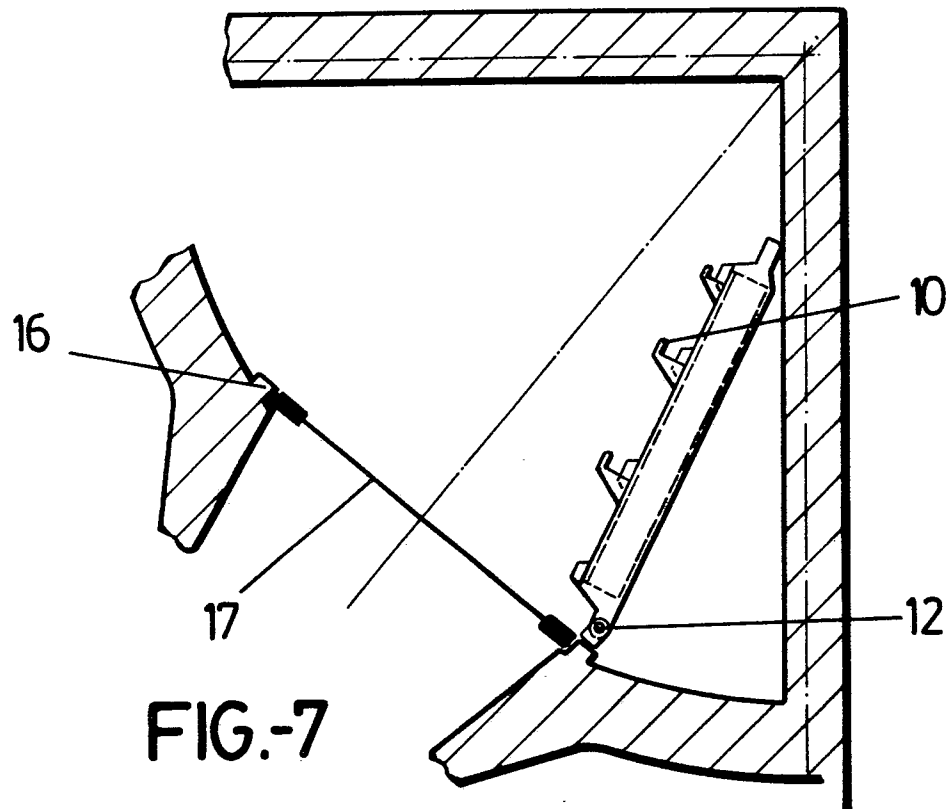
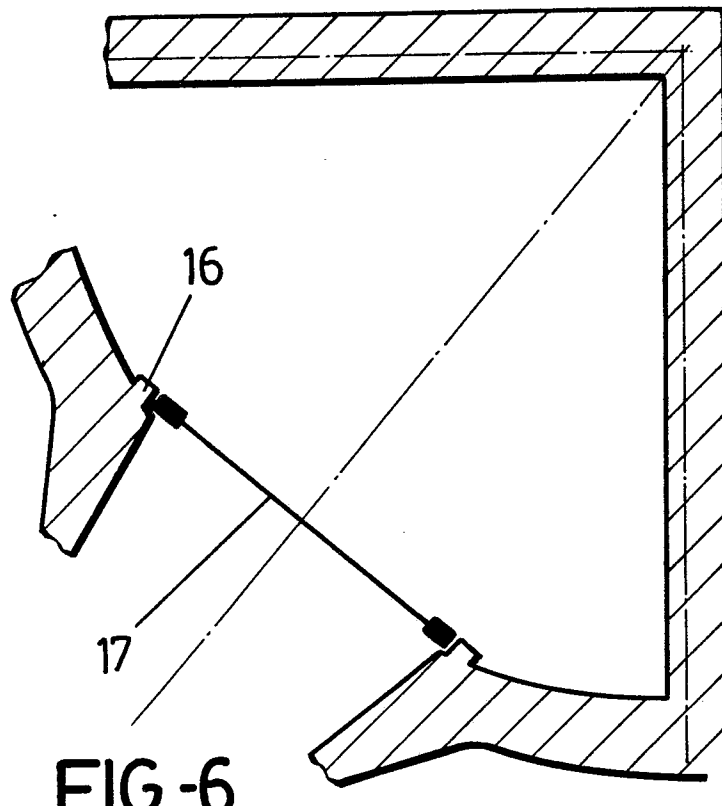
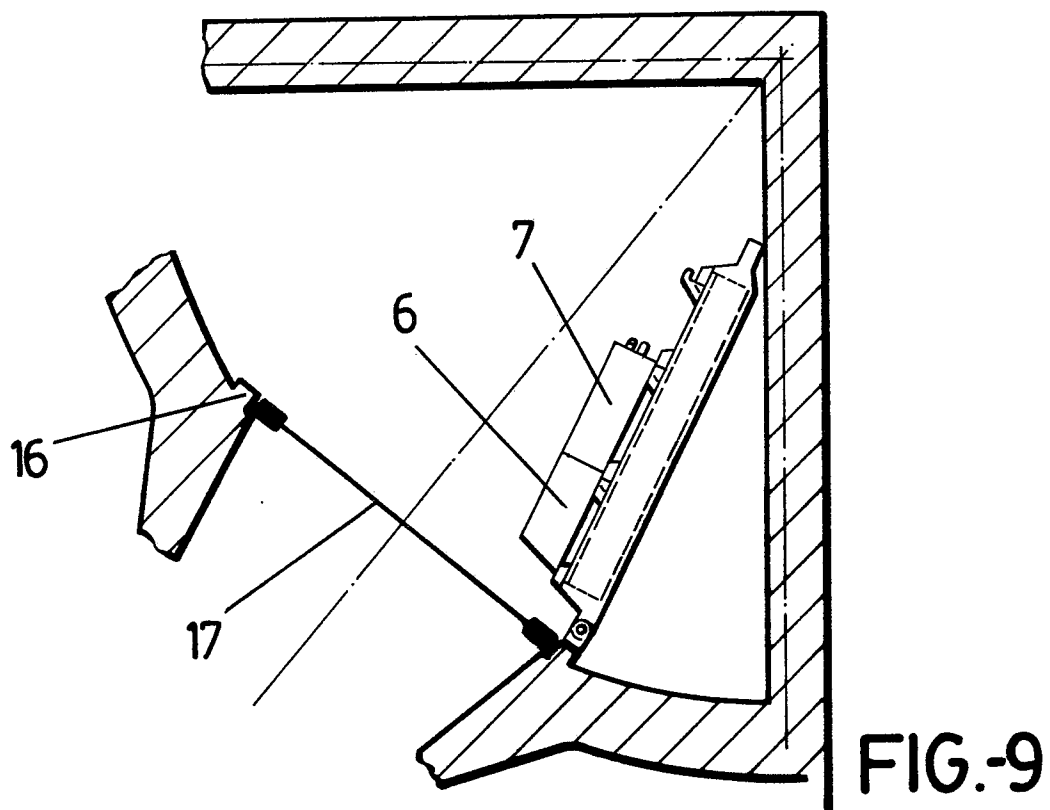
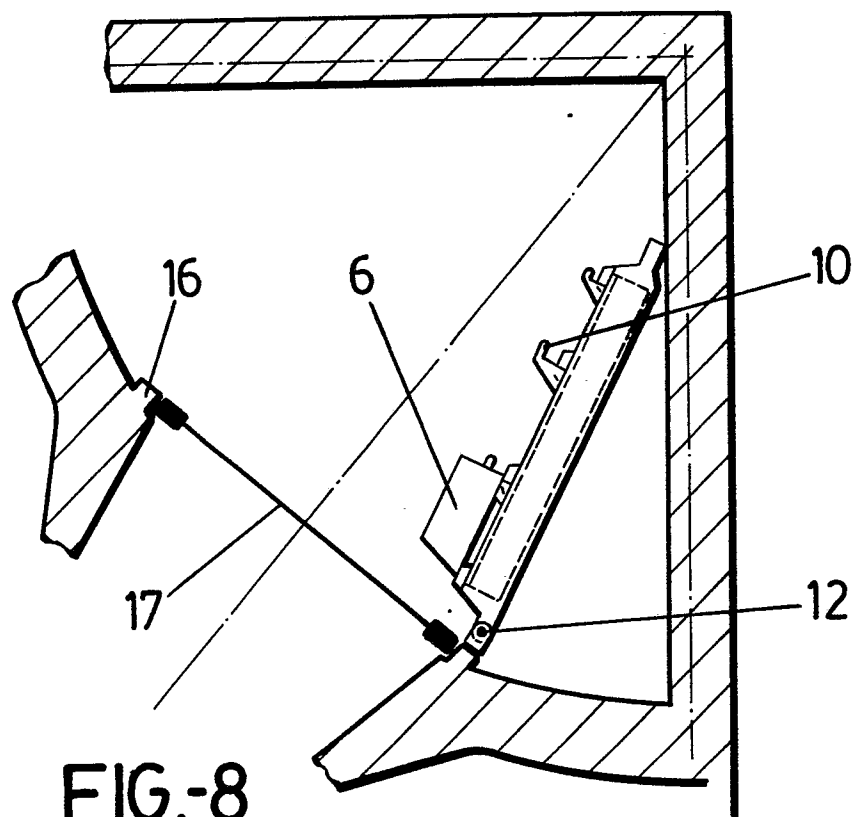


FIG.-2

0246994







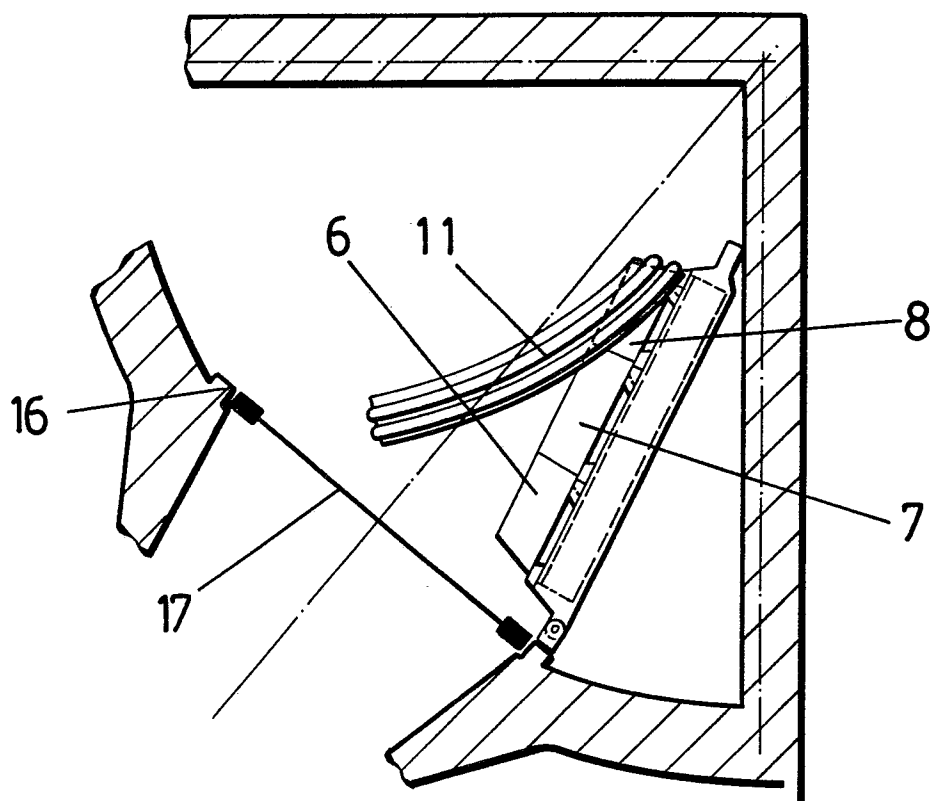


FIG.-10

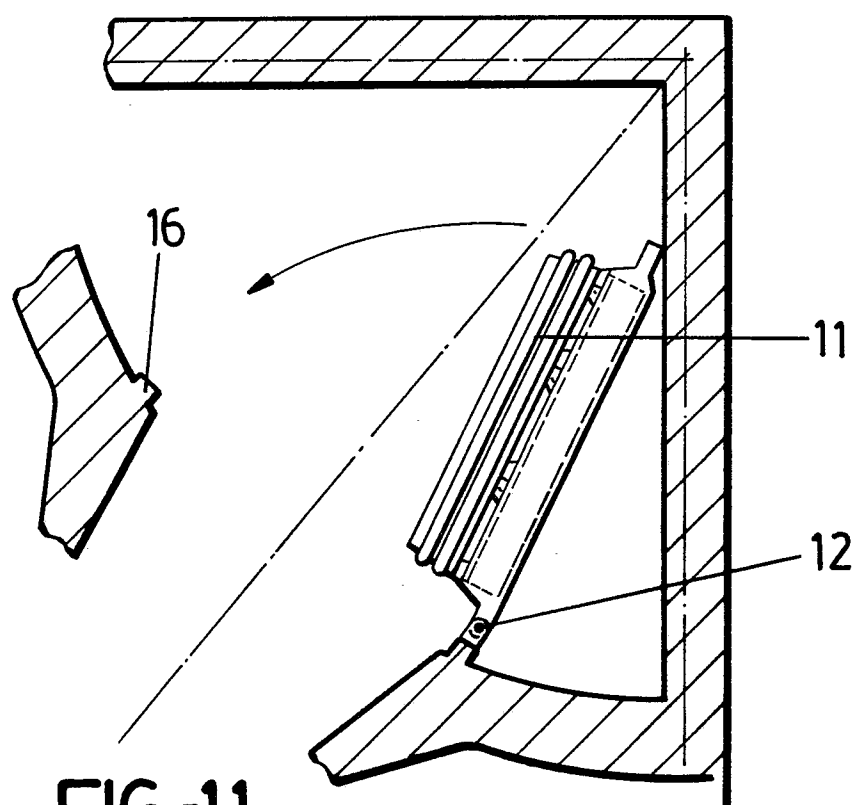


FIG.-11

0246994

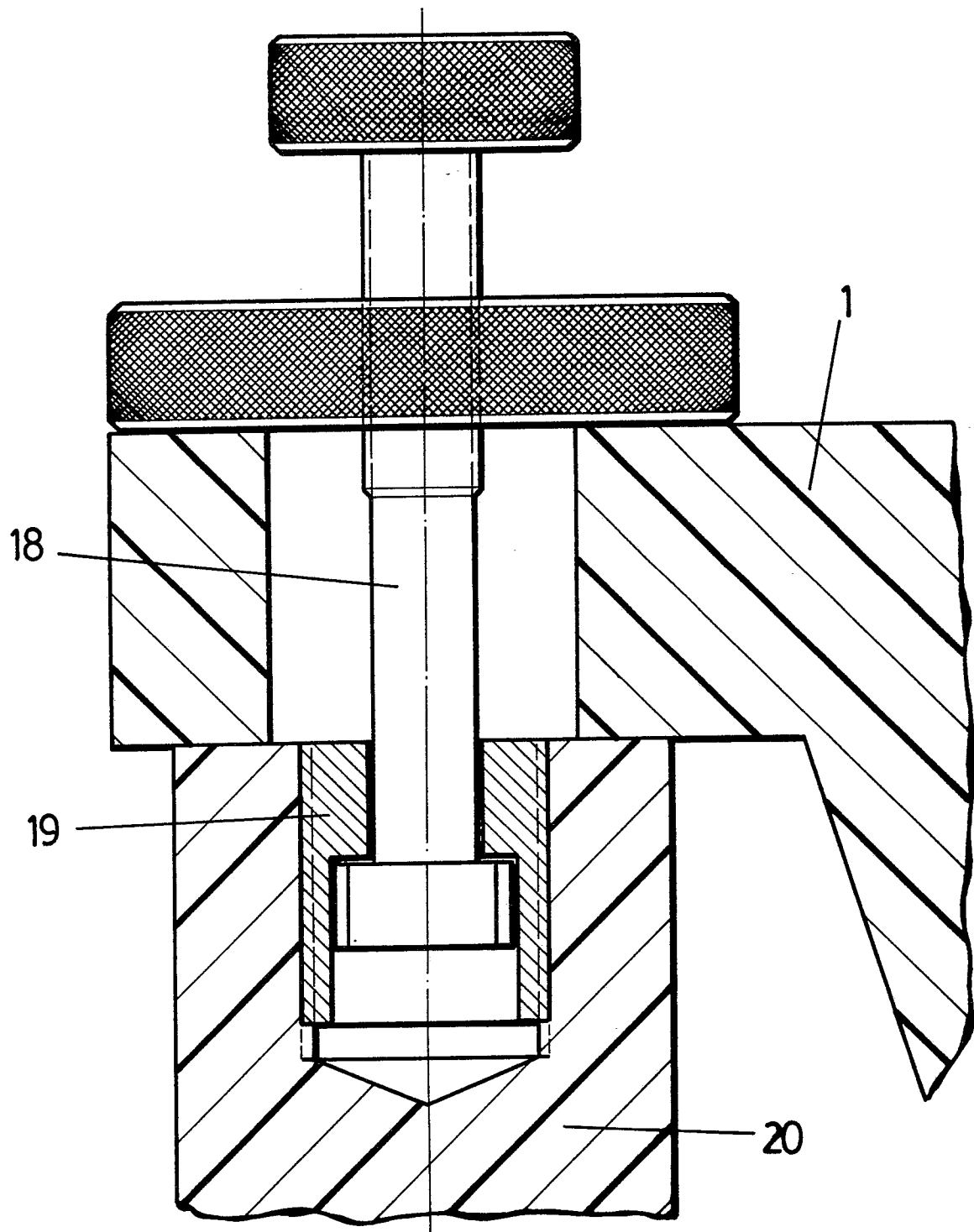


FIG.-12



European Patent
Office

EUROPEAN SEARCH REPORT

Application number

EP 87 50 0027

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
A	EP-A-0 014 878 (COMBUSTION) * Page 21, line 5 - page 23, line 35; figures *	1	F 22 B 37/22 F 16 L 55/10 G 21 C 13/06
A	FR-A-2 532 715 (THOME) * Abstract; figures *	1	
A	EP-A-0 170 789 (COMBUSTION)		
A	EP-A-0 163 087 (WESTINGHOUSE)		
			TECHNICAL FIELDS SEARCHED (Int. Cl.4)
			F 22 B F 16 L G 21 C
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 07-09-1987	Examiner VAN GHEEL J.U.M.
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			