FORM 1

COMMONWEALTH OF AUSTRALIA

PATENTS ACT 1952

613389

APPLICATION FOR A STANDARD PATENT

I\We,

HELLA KG HUECK & CO.

of POSTFACH 2840
LIPPSTADT 4780
GERMANY

hereby apply for the grant of a standard patent for an invention entitled:

MOTOR VEHICLE HEADLIGHT

which is described in the accompanying complete specification

Details of basic application(s):

Number of basic application	Name of Convention country in which basic application was filed	Date of basic application
P3729984.0	DE	08 SEP 87

My/our address for service is care of GRIFFITH HACK & CO., Patent Attorneys, 601 St. Kilda Road, Melbourne 3004, Victoria, Australia.

DATED this 10th day of August 1988

HELLA KG HUECK & CO.

GRIFFITH HACK & CO.

TO: The Commissioner of Patents.

GRIFFITH HACK & CO.

Australia Patent Declaration Form

Forms 7 and 8

AUSTRALIA

Patents Act 1952

DECLARATION IN SUPPORT OF A CONVENTION OR NON-CONVENTION APPLICATION FOR A PATENT OR PATENT OF ADDITION

No. 20636/88

Name(s) of Applicant(s)

In support of the application made by Hella KG Hueck & Co.

Title

for a patent for an invention entitled MOTOR VEHICLE HEADLIGHT

Name(s) and address(es) of person(s) making declaration

I/We, Rainer Fikus of Auf der Höh 6, 4780 Lippstadt-Rixbeck and Dr. Gerhard Nebe of Nerzweg 8, 4600 Dortmund 30

do solemnly and sincerely declare as follows:-

1. I/we am/are authorised by the abovementioned applicant to make this declaration on its behalf.

2. The basic application(s) as defined by Section 141 of the Act was/were made in the following country or countries on the following date(s) by the following applicant(s) namely:-

Country, filing date and name of Applicant(s) for the or each basic application

in Fed.Rep. of Germany on 8th September 19 87
by Hella KG Hueck & Co.
in _____ on _____ 19 _____
by _____

3. The said basic application(s) was/were the first application(s) made in a Convention country in respect of the invention the subject of the application.

Name(s) and address(es) of the or each actual inventor

4. The actual inventor(s) of the said invention is/are Hans Georg Stens of Rotbuschweg 20, 4780 Lippstadt-Bad Waldliesborn and Herbert Cramer of Lindenweg 3, 4784 Rüthen 2

See reverse side of this form for guidance in completing this part

5. The facts upon which the applicant(s) is/are entitled to make this application are as follows:-

The applicant is the assignee of the actual inventors.

DECLARED at Lippstadt this 23rd day of August 19 88

Hella KG Hueck & Co.

ppa. ppa.

This form may be completed and filed after the filing of a patent application but the form must not be signed until after it has been completely filled in as indicated by the marginal notes. The place and date of signing must be filled in. Company stamps or

(12) PATENT ABRIDGMENT (11) Document No. AU-B-20636/88
(19) AUSTRALIAN PATENT OFFICE (10) Acceptance No. 613389

(54) Title
MOTOR VEHICLE HEADLAMP ASSEMBLY

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(71) Applicant(s)
HELLA KG HUECK & CO.

(72) Inventor(s)
HANS GEORG STENS; HERBERT CRAMER

(74) Attorney or Agent
GRIFFITH HACK & CO , GPO Box 1285K, MELBOURNE VIC 3001

(56) Prior Art Documents
AU 40156/89 F21M 3/00
AU 28511/89 F21M 3/00

(57) Claim

1. Motor vehicle headlight with the following features:

a dish-shaped light bulb holder has a central opening in its base through which a light bulb can be inserted from the rear of the headlight, the light bulb has a base flange thereof, seated against the region of the base surrounding said opening and is pressed against it by two prongs of a curved U-shaped retaining spring which is fabricated from spring wire and is mounted to swivel around the end of said spring which is closed by a cross-piece which joins the two prongs of the U-shaped retaining spring together and is pivotably mounted, between at least one bearing surface which is open towards the direction of insertion of the light bulb and at least one nose of the light bulb holder which projects in the direction towards the base of the light bulb, so that it can pivot around its longitudinal axis, the U-shaped retaining spring engages with the free-end section of at least one prong beneath an undercutting in the light bulb holder, wherein it has the following features: the cross-piece which joins the two prongs of the U-shaped retaining spring together has a portion which curves outwardly in the direction opposite to the prongs of the retaining spring, the outwardly-curved portion of the cross-piece is configured with such a size and shape that, when it is swivelled into its fastening position, it engages underneath the nose.

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Form 10

COMPLETE SPECIFICATION

(ORIGINAL)

FOR OFFICE USE

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TO BE COMPLETED BY APPLICANT

Name of Applicant:
HELLA KG HUECK & CO.

Address of Applicant: POSTFACH 2840
LIPPSTADT 4780
GERMANY

Actual Inventor:

Address for Service: GRIFFITH HACK & CO.,
601 St. Kilda Road,
Melbourne, Victoria 3004,
Australia.

Complete Specification for the invention entitled:
MOTOR VEHICLE HEADLIGHT

The following statement is a full description of this invention including the best method of performing it known to me:-

The present invention relates to a motor vehicle headlight with the following features :

a) the dish-shaped light bulb holder has a central opening in its base through which the light globe can be inserted from the rear of the headlight,

b) the light bulb has its base flange seated against the region of the base surrounding the opening and is pressed against it by the two prongs of a curved U-shaped retaining spring which is fabricated from spring wire and is mounted to swivel around its closed end,

c) the cross-piece which joins the two prongs of the U-shaped retaining spring together is pivotably mounted between at least one bearing surface which is open towards the direction of insertion of the light bulb and at least one nose of the light bulb holder which projects in the direction towards the base of the light bulb so that it can pivot around its longitudinal axis,

d) the U-shaped retaining spring engages with the free-end section of at least one leg beneath an undercutting in the light bulb holder.

A known headlight for motor vehicles of this type is depicted in Fig. 1 and Fig. 2 of the drawing. The light bulb holder which is affixed to the reflector (not depicted) has a dish-shaped configuration and is manufactured by die casting or injection moulding. The light bulb is inserted from the rear of the headlight through a central opening in the base and has its flange seated against the region of the base surrounding the opening. On either side of the base of the light bulb, the two prongs of the curved U-shaped retaining spring which is fabricated from spring wire are pressed under tension against the side of the flange which faces in the opposite direction to that of insertion of the light bulb. One of the prongs of the U-shaped retaining spring is longer than the other and its free end section engages underneath the rim of an opening in the light bulb holder. The cross-piece which joins the two prongs of the U-shaped retaining spring together is located in an appendage of the light bulb holder which has a U-shaped cross-section opening towards the base. Each of the inner surfaces of

the U-shaped appendage which face towards each other is provided with a step, the abutting surface of which faces in the opposite direction to that of insertion of the light bulb and serves as the bearing surface for the cross-piece which joins the two prongs of the U-shaped retaining spring together. A hook-shaped nose is moulded centrally onto the U-shaped appendage between the two bearing surfaces and this nose serves as a counter-bearing for the retaining spring. When viewed in the direction of light emission from the headlight, the hook-shaped nose is seen to be of such a length that it will hold the retaining spring safely in its pivoting bearing location. When the retaining spring is being placed in position, its two prongs must be forced together manually to such an extent that the cross-piece which joins the two prongs of the U-shaped retaining spring together assumes a curved shaped sufficient to fit in underneath the nose. This type of assembly operation is very troublesome and time consuming. In addition to this, the retaining spring can only be mounted manually on such a type of light bulb holder, so that for mass-production methods this particular operation is very arduous.

The object of the present invention is the improvement of the swivel bearing of the light bulb holder and the retaining spring for the general type of headlight initially described in such a way that the retaining spring can be mounted easily and rapidly either manually or automatically. In addition to this, the retaining spring must hold the inserted light bulb securely in the light bulb holder, with the retaining spring and light bulb holder being cheap to manufacture.

This object is achieved in accordance with the present invention by incorporation of the following features :

e) the cross-piece which joins the two prongs of the U-shaped retaining spring together has a portion which curves outwards in the direction opposite to the prongs of the retaining spring,

f) the curved portion of the cross-piece is configured with such a size and shape that, when it is swivelled into its fastening position, it engages underneath the hook-shaped nose.

When the U-shaped retaining spring is placed in position, its prongs are disposed approximately radially in relation to the axis of the light bulb and point outwards. Furthermore, the retaining spring is turned through an angle of 180° in relation to its final position. The retaining spring is moved into the pivoting bearing either manually or automatically until its cross-piece comes into contact with the bearing surface. Following this, the retaining spring is swivelled around its pivoting axis into its final position.

In an expedient further development of the invention, the curved portion is located in the middle of the cross-piece which joins the two prongs of the U-shaped retaining spring together and the straight parts of the cross-piece on either side of the curved portion are each in contact with a bearing surface of the light bulb holder. In another expedient further development of the invention, curved portions are located at each end of the cross-piece adjacent to the prongs of the U-shaped retaining spring and the straight middle part of the cross-piece between the curved portions is in contact with a bearing surface of the light bulb holder. With these two possible forms of embodiment it is an additional advantage if the hook-shaped nose is of such a size and shape that it projects into, and over, the space behind the outwardly-curved portion of the cross-piece of the retaining spring in all the locations of the desired pivoting range of said retaining spring and the bearing surface for the retaining spring on the light bulb holder is formed by a slot which opens transversely to the rear side of the headlight. With such an arrangement in the two forms of embodiment, it is possible for the retaining spring to be swivelled around freely without any jerky motion.

It is an additional advantage if the section of the nose beneath which the outwardly-curved portion of the cross-piece engages in the desired pivoting range of said retaining spring is formed as a cylindrically-shaped surface section which runs parallel to the pivoting axis of the retaining spring, with the radius of the cylinder being approximately equal to the depth of the outwardly-curved portion and with the width of the nose being approximately equal to the width of said curved portion.

In this way the retaining spring is held with very little freedom of play in its pivoting bearing.

In addition to this, it is an advantage if the side surfaces, which face towards one another, of the slot in which the retaining spring is pivotably mounted are designed to be higher than the side surfaces which face away from the light bulb base. During the mounting of the retaining spring, the higher side surfaces serve as a stop for the cross-piece which joins the two prongs of the U-shaped retaining spring together.

Furthermore, it is advantageous for a wall to run radially outwards from the upper side of the nose, with the end surface of the wall passing over into a run-up slope for the outwardly-curved portion of the retaining spring. With this arrangement, when the retaining spring is being inserted, it occupies such a position that the wall which is connected to the nose is located in the space behind the outwardly-curved portion and thus acts as a guide for the retaining spring.

Additional expedient forms of embodiment in accordance with the present invention are described in subsidiary Patent Claims 10 to 14.

A known type of headlight for motor vehicles used for the formulation of the preamble is illustrated in the drawings.

Fig. 1 is a section through the light bulb holder of the known headlight along the line A-A in Fig. 2 and

Fig. 2 is a plan of the known light bulb holder, whereas

Fig. 3 is a section through the light bulb holder in accordance with the invention along the line B-B in Fig. 4,

Fig. 4 is a plan of the light bulb holder in accordance with the invention,

Fig. 5 is a plan of the light bulb holder showing the retaining spring before it is swivelled into position and

Fig. 6 is a section along the line C-C in Fig. 4 through the pivoting bearing of the light bulb holder.

The known light bulb holder (1') depicted in Fig. 1 and Fig. 2 is dish-shaped and is fabricated by die casting. The light bulb (2') with its front-end glass envelope is inserted from the rear of the light bulb holder through a central opening (3') in the base of said light bulb holder until the

flange (4') around the light bulb base is seated against the region of the base surrounding the opening (3'). On the two opposite sides of the flange (4') there is a pre-tensioned curved U-shaped retaining spring (5') which is fabricated from spring wire. The cross-piece (7') which joins the two prongs (6') of the U-shaped retaining spring together is pivotably mounted on the light bulb holder (1').

The pivoting bearing is formed by a hook-shaped nose (8') with an opening in the direction of light emission with two bearing surfaces (9') which open in the direction of insertion of the light bulb. The cross-piece (7') of the U-shaped retaining spring (5') is seated with each of its straight end sections against the two bearing surfaces (9') respectively. Each of the two bearing surfaces (9') is formed by an abutment surface of a step of the opposite walls (10') and runs at an acute angle to the main direction of the retaining spring (5'). The hook-shaped nose (8') is designed to be of such a length that the cross-piece (7') which joins the two prongs (6') of the U-shaped retaining spring (5') together can only be inserted between the nose (8') and the two bearing surfaces (9') when the two prongs (6') of the U-shaped retaining spring (5') are forced together manually to such an extent that the cross-piece (7') assumes a curved shaped sufficient to fit in underneath the nose. One of the two prongs (6') of the U-shaped retaining spring (5') is longer than the other and its free end section (11') which is bent at an angle engages underneath the rim of an opening in the light bulb holder (1').

In what follows, the differences of the light bulb holder (1) in accordance with the present invention which is illustrated in Figures 3, 4, 5 and 6 from the previously discussed known type of light bulb holder (1') will now be described. The U-shaped curved retaining spring (5) has a the cross-piece (7) which joins its two prongs together with a central portion which curves outwards and is open in the direction facing towards the base of the light bulb (2). The outwardly-curved portion (15, 16) has a U-shaped configuration. Immediately adjacent to the U-shaped portion (15, 16) of the retaining spring, the two short straight sections of the cross-piece (7)

are respectively in contact with the two bearing surfaces (9) which are formed by slots in the light bulb holder (1) which open towards the rear side of the headlight. Between these slots there is located a nose (8) which points towards the base of the light bulb. The nose (8) has a cylindrically-shaped surface section (14) which is concentric with the pivoting axis of the retaining spring and in its projection surface it faces towards the light-emission opening of the headlight. The radius of the cylindrically-shaped surface section (14) is approximately equal to the distance of the pivoting axis (12) away from the inner side of the U-shaped curved portion (15) of the cross-piece (7) of the retaining spring (5). The width of the nose (8) is approximately equal to the distance between the two legs (16) of the U-shaped curved portion (15) in the cross-piece of the retaining spring (5). There is an appendage (17) moulded onto the cylindrically-shaped surface section to serve as an arresting stop. The surface of the appendage (17) which is facing towards the light bulb gradually merges into the cylindrically-shaped surface section (14) of the nose (8). This makes it possible, during the mounting of the retaining spring (5), for the U-shaped curved central portion (15) which joins the two legs (16) together to slide on over the appendage (17). This appendage (17), which serves as an arresting stop, along with the extension (18) form a locating device for the retaining spring (5). The cross-piece (7) which joins the two prongs (6) of the U-shaped retaining spring (5) together is disposed between two walls (19) which run at right angles to it. The wall (22) which is joined to the nose (8) is provided with the run-up slope (23) on the side which faces away from the light bulb.

For the mounting of the U-shaped retaining spring (1), said spring is turned over through 180° in relation to its final assembled position and with its cross-piece (7) which joins the two prongs (6) together at its leading end it is moved in the direction (arrow 24) (see Fig. 3) towards the pivoting bearing. This brings the central web (15) of the U-shaped portion of the cross-piece (7) of the retaining spring into contact with the run-up slope (23) of the wall (22) and it

is guided by this wall because it projects into the U-shaped portion when the retaining spring (5) is in the appropriate position. The two walls (19) which run parallel to the prongs (6) of the retaining spring (5) provide assistance in the insertion operation, and the walls (20) which are adjacent to the base of the light bulb serve as an arresting stop for the short straight portions of the cross-piece of the U-shaped retaining spring. Following this, the cross-piece (7) is in contact with the bearing surfaces (9) and the nose (8) projects into the U-shaped portion of the cross-piece of the retaining spring (5) (see Fig. 5). Subsequently, the retaining spring (5) is pivoted in the direction (arrow 25) (see Fig. 3) around the pivoting axis (12) until the web (15) of the U-shaped portion of the cross-piece (7) of the retaining spring (5) comes to rest behind the appendage (17) on the nose (8) which serves as an arresting stop. In this way the retaining spring (5) is held safely in the pivoting bearing so that it cannot become dislodged and lost. After the retaining spring (5) has been positioned in the locating device formed by the appendage (17) and extension (18), the prongs (6) of the retaining spring (5) are approximately parallel to the axis of the light bulb. Thus the retaining spring does not hinder the changing of the light bulb. In the fastening position of the retaining spring (5), the end sections (11) of the prongs (6) are bent around to form circular loops which engage underneath the hook-shaped undercut projections (26) (see Fig. 3) on the light bulb holder (1).

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. Motor vehicle headlight with the following features:
a dish-shaped light bulb holder has a central opening in its base through which a light bulb can be inserted from the rear of the headlight, the light bulb has a base flange thereof, seated against the region of the base surrounding said opening and is pressed against it by two prongs of a curved U-shaped retaining spring which is fabricated from spring wire and is mounted to swivel around the end of said spring which is closed by a cross-piece which joins the two prongs of the U-shaped retaining spring together and is pivotably mounted, between at least one bearing surface which is open towards the direction of insertion of the light bulb and at least one nose of the light bulb holder which projects in the direction towards the base of the light bulb, so that it can pivot around its longitudinal axis, the U-shaped retaining spring engages with the free-end section of at least one prong beneath an undercutting in the light bulb holder, wherein it has the following features: the cross-piece which joins the two prongs of the U-shaped retaining spring together has a portion which curves outwardly in the direction opposite to the prongs of the retaining spring, the outwardly-curved portion of the cross-piece is configured with such a size and shape that, when it is swivelled into its fastening position, it engages underneath the nose.

2. The headlight according to Claim 1, wherein the outwardly-curved portion is located centrally in the cross-piece which joins the two prongs of the retaining spring together and two short straight sections of the cross-piece which are immediately adjacent to the curved portion are respectively in contact with a bearing surface of the light bulb holder.

3. The headlight according to Claim 1, wherein outwardly-curved portions are located in the cross-piece

immediately adjacent to each of the prongs of the retaining spring and a straight central portion of the cross-piece is in contact with a bearing surface of the light bulb holder.

4. The headlight in accordance with any one of the preceding claims, wherein the nose is of such a size and shape that it projects into, and over, the space behind the outwardly-curved portion of the cross-piece of the retaining spring in all the locations of the desired pivoting range of said retaining spring.

5. The headlight in accordance with any one of Claims 1 to 4, wherein the bearing surface of the light bulb holder for the retaining spring is formed by a slot which opens towards the rear side of the headlight.

6. The headlight in accordance with any one of Claims 1 to 5, wherein, in the desired pivoting range of the retaining spring, the section of the nose beneath which the outwardly-curved portion engages is configured as a cylindrically-shaped surface section which is concentric with the pivoting axis of the retaining spring and has a radius approximately equal to the depth of the space enclosed by the U-shaped curved portion.

7. The headlight in accordance with any one of Claims 1 to 6, wherein the breadth of the nose is approximately equal to the breadth of the space enclosed by the U-shaped curved portion.

8. The headlight in accordance with any one of Claims 1 to 7, wherein side surfaces, which face towards one another, of the slot in which the retaining spring is pivotably mounted, are designed to be higher than a side surface which faces away from the light bulb base.

9. The headlight in accordance with any one of Claims 1 to 8, wherein a wall runs radially outwards from the upper side of

the nose, with the end surface of the wall passing over into a run-up slope for the outwardly-curved portion of the retaining spring.

10. The headlight in accordance with any one of Claims 1 to 9, wherein the cross-piece which joins the two prongs of the U-shaped retaining spring together is disposed between two walls which run at right angles to it and which are of such a height that they provide assistance in the insertion of said retaining spring.

11. The headlight in accordance with any one of Claims 1 to 10, wherein there is an appendage moulded onto the cylindrically-shaped surface section of the nose to serve as an arresting stop for the retaining spring which may be pivoted through an angle of approximately 90°.

12. The headlight in accordance with Claim 11, wherein the surface of the appendage which is facing towards the light bulb gradually merges into the cylindrically-shaped surface section of the nose.

13. The headlight in accordance with Claim 12, wherein the cylindrically-shaped surface section of the nose has a locating device for the retaining spring which is formed by the appendage which serves as an arresting stop and a second extension which is lower than the first appendage and is at a distance away from it which is approximately equal to the diameter of the wire used for the retaining spring.

14. The headlight in accordance with any one of Claims 1 to 13, wherein the outwardly-curved portion of the cross-piece of the retaining spring has a U-shaped configuration.

DATED THIS 10TH DAY OF AUGUST 1988

HELLA KG HUECK & CO.
By its Patent Attorneys:

GRIFFITH HACK & CO.
Fellows Institute of Patent
Attorneys of Australia.

FIG 1

Schnitt A-A

1/3

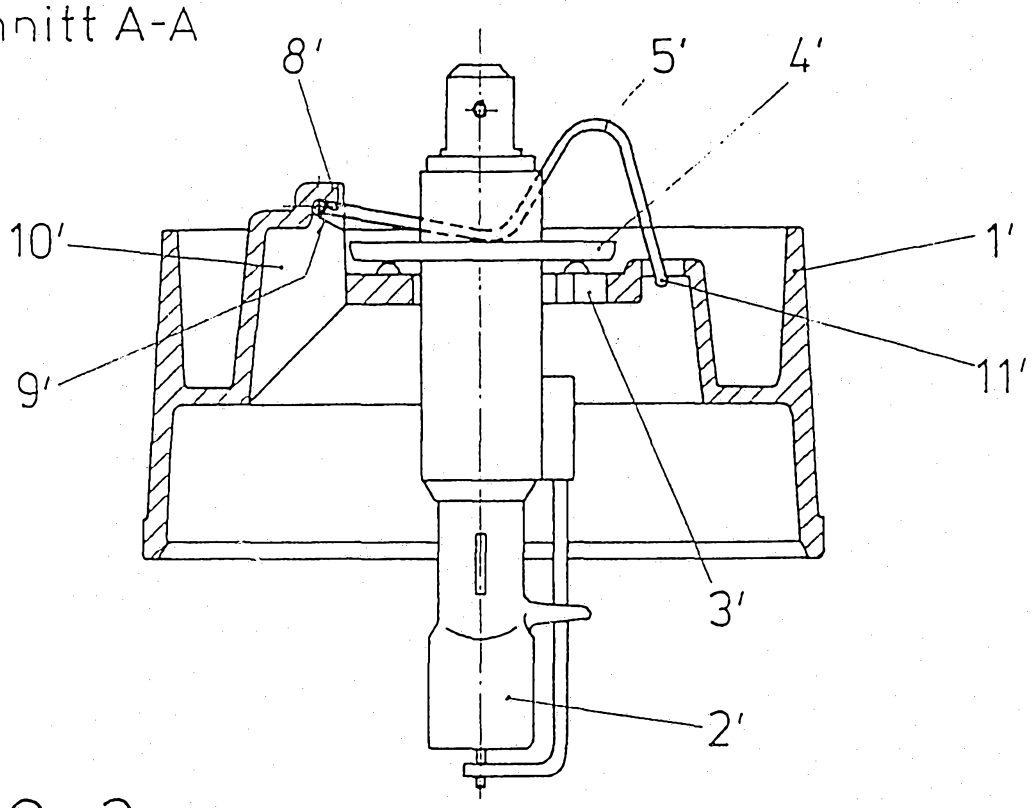


FIG 2

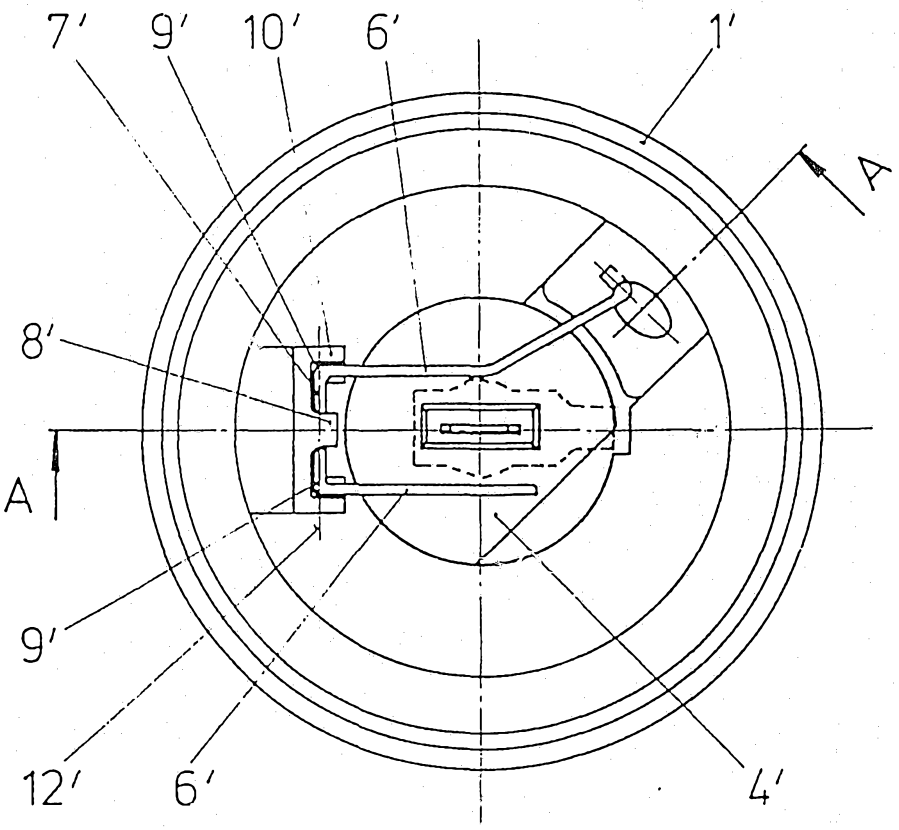


FIG 3
Schnitt B-B

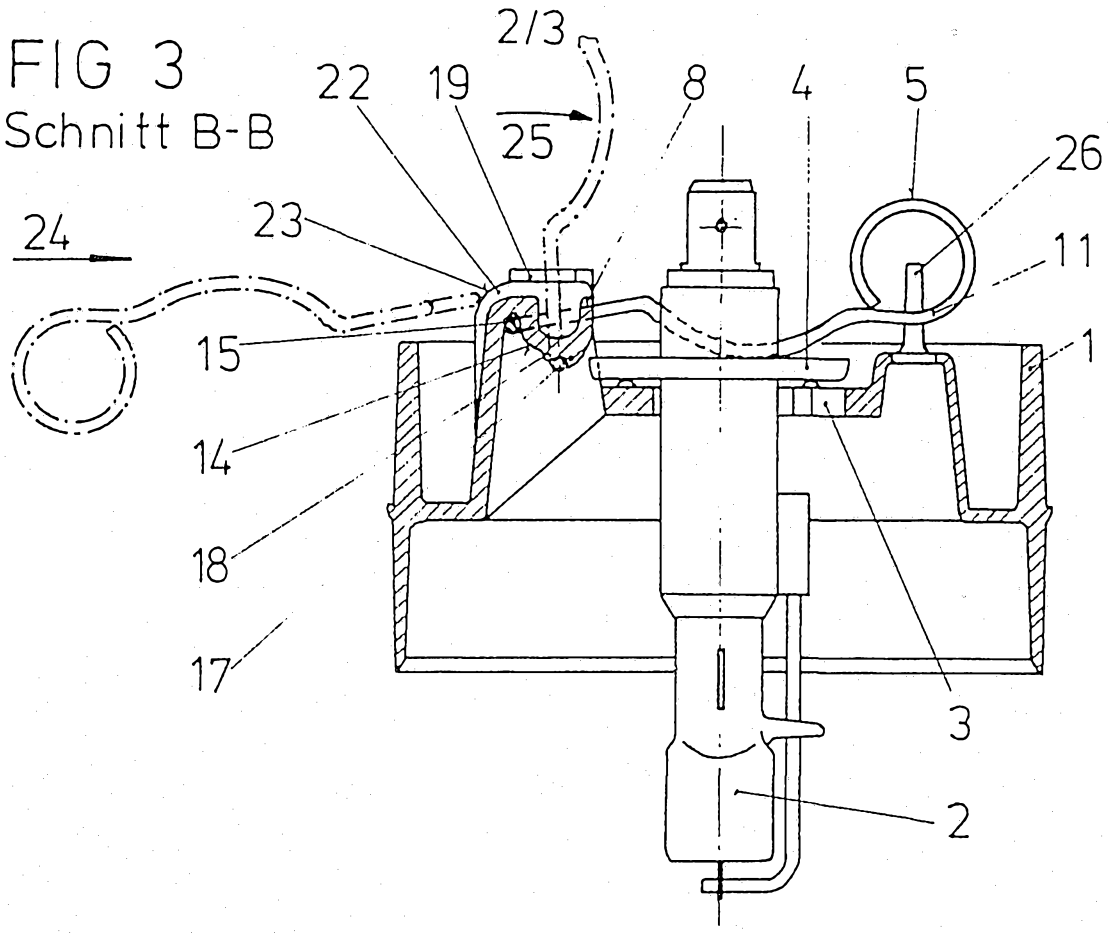
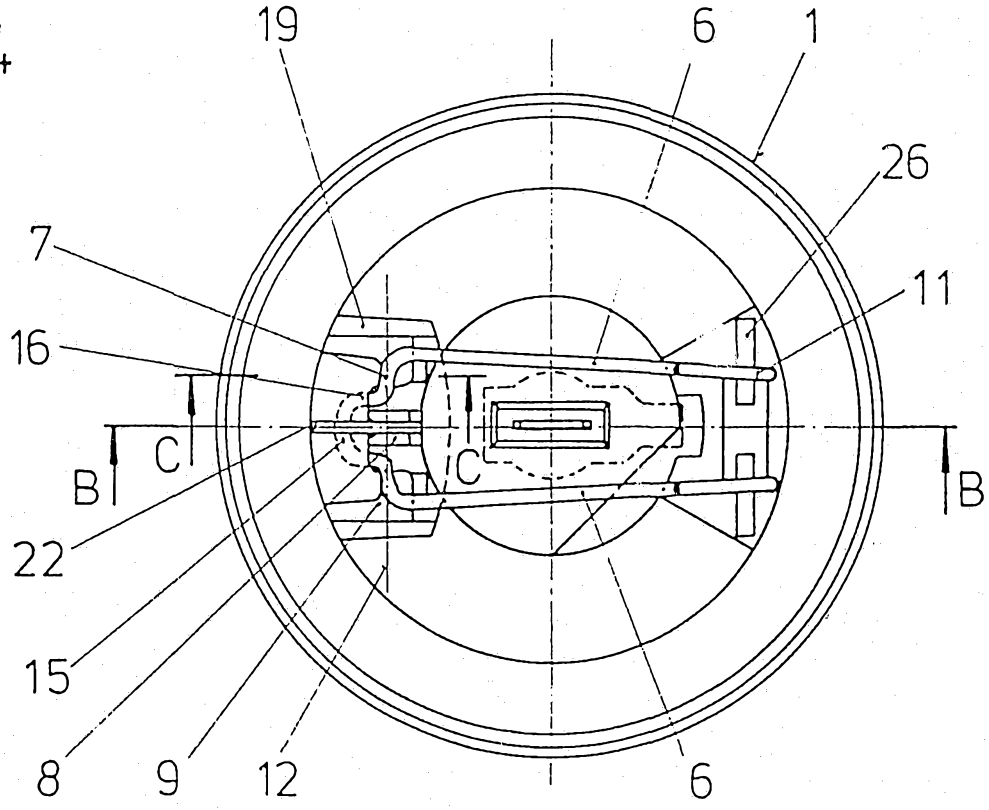


FIG 4



3/3

FIG 5

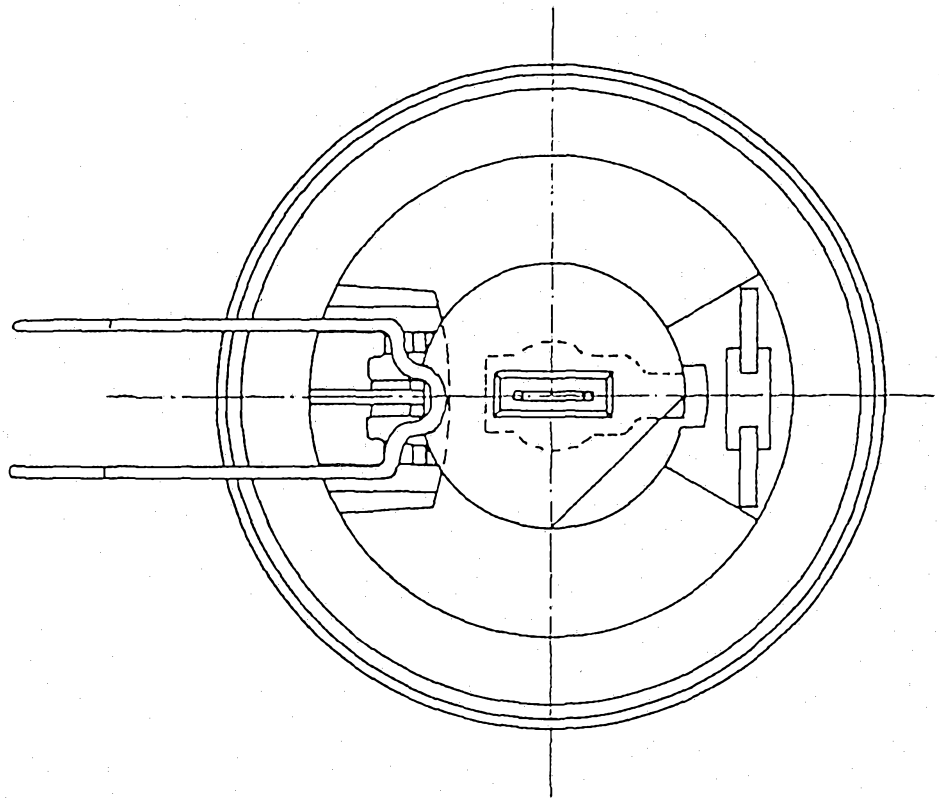


FIG 6

Schnitt C-C