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(54) **Mounting arrangement for a lid or door lock**

Montieranordnung für ein Schloss einer Kofferraumklappe oder einer Tür

Arrangement de montage d'une serrure d'une capot ou d'une porte

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EP 0 611 127 B1

Description

This invention relates to a mounting arrangement for a lid or door lock and particularly but not exclusively to a mounting arrangement for the lock of a luggage compartment door or tailgate of a motor vehicle.

Accordingly the present invention will be described below with reference to motor vehicles but it should be appreciated that the invention may be employed for a lock on any lid or door which lock may be susceptible to being forcibly removed particularly by pulling it out to gain access to an opening mechanism.

While the protection against theft of personal valuables carried in a motor vehicle may often be improved by locking such items in the luggage or rear compartment of the vehicle, such compartments are vulnerable to being broken into.

Common methods employed for breaking into such compartments include forcible removal of the cylinder of the lock to gain access to the door release mechanism. This may be done by applying high torque to the lock cylinder to wrench it out of its supporting surfaces (sometimes referred to as "torquing out"). Alternatively, high pulling forces may be applied to pull out the cylinder (sometimes referred to generally as "pulling out"). Further, by applying high leverage forces to the cylinder the supporting surfaces may be bent or distorted to permit cylinder removal or to otherwise gain access to the release mechanism (sometimes referred to generally as "bending out").

While it has been proposed, for example, in US Patent Specification 4 041 741, to apply a protective plate to the outside of the door to prevent the lock from being pulled out, this is an aesthetically unattractive solution proposal. Further, the proposal of this US Patent 4 041 741 requires additional holes to be produced through the door skin, which adds to potential corrosion sites.

It is also known from US Patent Specification 3 868 836 to provide a bracket within the door to support an inner end of a lock barrel. In this construction, a limited resistance to twisting of the lock mechanism in the panel is achieved by engagement of flats on the barrel with opposite legs of a spring clip.

According to the present invention, there is provided a mounting arrangement for mounting a lock to a vehicle skin panel, the arrangement comprising a lock cylinder, a hole in the skin panel for receiving the lock cylinder and a bracket which has a foot portion fixed to the skin panel at a distance from the inner surface of the portion of said skin panel on which said hole is provided and an upstanding portion, characterised in that the arrangement includes a plate mounted on the cylinder and fixed against rotation relative to the cylinder, the plate locating behind the bracket so that engagement of the plate against the bracket resists pull-out forces exerted on the cylinder, and wherein the upstanding portion of the bracket is provided with spaced holes and the plate has corresponding spigots which fit in the holes to resist

twisting forces exerted on the cylinder.

According to the present invention, there is also provided a luggage compartment lid including such a mounting arrangement.

While the bracket, plate and lock barrel are preferably made of metal, other materials having satisfactory strength may alternatively or additionally be employed.

In this latter context it is important that the bracket can be firmly welded or otherwise fixed to the material of the skin of the enclosure. Accordingly, when the enclosure comprises a compartment of a motor vehicle and having a skin of metal, a metal bracket may be easily welded to the inner surface of the skin, by spot-welding for example, during the process of vehicle manufacture. To this extent, subsequent finishing processes applied to the skin may be applied also to the bracket. The bracket is shaped to permit it to be bonded to the inner surface of the skin while presenting an upstanding portion spaced from the inner skin and on which the plate of the mounting is directly or indirectly locatable. Preferably, the bracket has a substantially planar foot portion that is bonded to the skin and an upstanding substantially planar portion at right angles thereto.

It is preferred that the plate has a non-circular hole, and the cylinder has a corresponding non-circular part which fits through the hole so that the plate cannot rotate relative to the cylinder. The arrangement preferably also includes a retaining clip adapted to fit into a groove on the end of the cylinder to retain the plate on the cylinder.

The retaining clip can occupy the groove around at least 120° of arc, preferably substantially 180° of arc.

The cylinder can have a radially extending flange at its key-receiving end, and a tubular spacer sleeve can be fitted around the cylinder to space the plate from the flange.

The plate is provided with locating spigots to closely locate into the holes in the bracket with the plate in position and attached to the cylinder to thereby locate the plate on the bracket. It will be seen that in such an arrangement, if a high torque is applied to the cylinder and plate this will be resisted by the spigots.

It will be appreciated that the thickness and strength of the plate and bracket can readily be tailored to levels necessary to prevent or at least impair pulling out of the cylinder and, as may be desired, torquing out and bending out also. Bending out is clearly resisted by the support given to the cylinder, at a distance spaced from the skin panel by the plate and bracket for example via located spigots and through any direct contact made between the cylinder and the upper edge of the bracket.

In a preferred embodiment the spacing of at least two of the spigots is preferably such that lines drawn from the centre lines of the spigots to the longitudinal axis of the cylinder and perpendicular thereto form an obtuse angle between one another.

It will be appreciated that in mounting the lock to for example, a motor vehicle luggage compartment door or tailgate, the end flange on the cylinder may be backed

by a resilient seal. Such a seal enables the atmospheric elements to be excluded from around the bezel or flange, provides protection for surrounding paintwork and some resilience to allow for functional tolerances.

The spigots which may be provided on the plate are preferably of the same material type as the plate and are preferably studs welded on or through the plate but alternatively they may be for example threaded studs or bolts screwed through the plate.

The present invention will now be further described by way of example, with reference to the accompanying drawings in which:

Figure 1 is a schematic view of the rear end of a motor vehicle indicating the position of a lock mounting arrangement in accordance with the invention;

Figure 2 is a forward looking elevation of a mounting arrangement according to the invention;

Figure 3 illustrates in side elevation and in part section the mounting shown in Figure 1 assembled with a lock cylinder inserted through a vehicle door skin;

Figure 4 illustrates in part section the manner of attachment of the plate to the cylinder shown in Figure 2;

Figure 5 is a perspective view of part of the mounting; and

Figure 6 is an exploded view of a cylinder and spring clip.

In Figure 1, the position of a lock mounting arrangement according to this invention is indicated by the dotted outline signified by X.

Figures 2 to 5 show a bracket 1 provided with strengthening ribs 2 which is spot welded along the length of its substantially planar foot portion 3 to the inside of a vehicle door skin 4. An upstanding substantially planar portion 5 of the bracket 1 is at right angles to the foot portion 3. The upstanding portion is provided with two spaced holes 6 and 7.

The upstanding portion 5 is further provided with a recess 19 in its upper edge. A lock cylinder 9 has a flange 17 at its key-receiving end. The cylinder is inserted through an opening in the door skin 4 and is accommodated in the recess 19.

A plate 8 is attached to the lock cylinder 9 by a spring clip 10 which enters a peripheral groove 20 situated near the cylinder end (shown in Figure 4 which is in part section for this purpose and also shown in Figure 6). the groove 20 extends completely around the cylinder 9, and the clip 10 occupies about 180° of arc when fitted in the groove 20. The plate is positioned relative to the flange 17 and to the skin panel 4 with the aid of a

tubular spacer sleeve 11. The plate 8 is illustrated having an extension 12 and a side plate 13 which serve to brace the plate 8 and also provide a convenient housing for an electrical switch (not shown). The plate 8 is provided with two spigots 14 and 15 welded to the plate 8. The spigots are of such length and diameter as to fit and extend through the holes 6 and 7 to thereby locate the plate 8 on the bracket 1.

The plate 8 is provided with a hole 16 having a shaped, non-circular edge in conformation with the external non-circular shape of the lock cylinder 9. A similar hole is provided through the vehicle door skin 4. A flange 17 is provided on the outward end of the lock cylinder and a rubber seal 18 is shown in Figure 3 inserted between the flange and the door skin.

In mounting the lock cylinder 9 within the door skin 4; with the bracket 1 welded to the skin 4, the end of the lock cylinder is passed through the hole provided in the skin 4 until the seal 18 provided under the flange 17 contacts the skin 4. The tubular spacer sleeve 11 of suitable length is placed over the cylinder and the end of the cylinder remote from the flange 17 is passed through the shaped hole in the plate 8. The plate is pushed onto the cylinder until it contacts the end of the spacer 11 and the spigots 14 and 15 become aligned with and enter the holes 6 and 7 in the bracket 1 to thereby establish location of the plate 8 on the bracket 1. With light pressure being applied in opposing directions to the bezel end of the cylinder and to the plate 8, the spring clip 10 is inserted in the groove 20 to thus attach the plate 8 to the cylinder 9. The spring tangs 21 of the clip 10 press against an inner surface of the groove 20 to retain the clip 10 in position and the fingers 22 of the clip 10 extend beyond the groove 20 and the lateral edges of the hole in the plate 8 to prevent the cylinder 9 from being removed from the plate 8.

It will be seen that rotation of the cylinder 9 relative to the door skin 4 will be resisted not only by the non-circular shape of the hole in the door skin 4 but more importantly by the shape of the hole in the plate 8 which is itself supported against rotation by the spigots 14 and 15 engaging in the holes 6 and 7. Thus, torquing out of the cylinder will be strongly resisted. Bending out of the cylinder will clearly be strongly resisted by the arrangement, support coming from the bracket 1 through the spigots 14 and 15 to the plate 8; direct support from the bracket 1 is also available in the event of direct contact between the cylinder 9 and the recess 19 at the edge of the upstanding portion 5 of the bracket 1.

The mounting illustrated will also resist pulling out of the cylinder of the lock because the plate 8 is locked to the cylinder by the clip 10, and axial movement of the plate is blocked by the bracket 1.

Claims

1. A mounting arrangement for mounting a lock to a

vehicle skin panel, the arrangement comprising a lock cylinder (9), a hole in the skin panel (4) for receiving the lock cylinder and a bracket (1) which has a foot portion (3) fixed to the skin panel (4) at a distance from the inner surface of the portion of said skin panel on which said hole is provided, and an upstanding portion (5), characterised in that the arrangement includes a plate (8) mounted on the cylinder (9) and fixed against rotation relative to the cylinder, the plate locating behind the bracket (1) so that engagement of the plate against the bracket resists pull-out forces exerted on the cylinder, and wherein the upstanding portion (5) of the bracket (1) is provided with spaced holes (6,7) and the plate (8) has corresponding spigots (14,15) which fit in the holes to resist twisting forces exerted on the cylinder (9).

2. An arrangement as claimed in Claim 1, characterised in that the plate (8) has a non-circular hole (16), and the cylinder (9) has a corresponding non-circular part which fits through the hole so that the plate cannot rotate relative to the cylinder, the arrangement also including a retaining clip (10) adapted to fit into a groove (20) on the end of the cylinder to retain the plate on the cylinder.
3. An arrangement as claimed in Claim 2, characterised in that the retaining clip occupies the groove around at least 120° of arc.
4. An arrangement as claimed in any preceding claim, characterised in that the cylinder (9) has a radially extending flange (17) at its key-receiving end, and a tubular spacer sleeve (11) is fitted around the cylinder to space the plate (8) from the flange.
5. A luggage compartment lid including a mounting arrangement as claimed in any preceding claim.

Patentansprüche

1. Eine Montieranordnung zur Befestigung eines Schlosses an einem Fahrzeugkarosserieblech, wobei die Montieranordnung einen Schloßzylinder (9), ein Loch im Karosserieblech (4) zur Aufnahme des Schloßzylinders und eine Spange (1) umfaßt, die einen Sockelbereich (3) aufweist, der in einer gewissen Entfernung von der Innenfläche des Bereiches dieses Karosseriebleches (4), an dem dieses Loch bereitgestellt ist, befestigt ist, sowie einen nach oben ragenden Bereich (5), dadurch gekennzeichnet, daß die Anordnung eine Platte (8) umfaßt, die an dem Zylinder (9) angebracht ist und gegen Drehungen bezüglich des Zylinders befestigt ist, wobei sich die Platte hinter der Spange (1) befindet, so daß durch das Hineingreifen der Platte in die

Spange den Zugkräften, die nach außen auf den Zylinder ausgeübt werden, entgegengewirkt wird, und worin der nach oben ragende Bereich (5) der Spange (1) mit in einem Abstand voneinander befindlichen Löchern (6, 7) versehen ist und die Platte (8) entsprechende Zapfen (14, 15) aufweist, die in die Löcher eingepaßt sind, um Drehkräften, die auf den Zylinder (9) ausgeübt werden, zu widerstehen.

2. Eine Anordnung nach Anspruch 1, dadurch gekennzeichnet, daß die Platte (8) ein nicht kreisförmiges Loch (16) und der Zylinder (9) ein entsprechendes nicht kreisförmiges Bauteil aufweisen, das in das Loch eingepaßt ist, so daß sich die Platte nicht bezüglich des Zylinders drehen kann, wobei die Anordnung auch einen Haltebügel (10) umfaßt, der angepaßt ist, in eine Vertiefung (20) am Ende des Zylinders zu passen, um die Platte am Zylinder festzuhalten.
3. Eine Anordnung nach Anspruch 2, dadurch gekennzeichnet, daß der Haltebügel in die Vertiefung über einen Winkel von mindestens 120° eingreift.
4. Eine Anordnung nach irgendeinem der vorstehenden Ansprüche, dadurch gekennzeichnet, daß der Zylinder (9) einen radial verlaufenden Flansch (17) an dem Ende aufweist, das den Schlüssel aufnimmt, und daß eine rohrförmige Abstandshülse (11) um den Zylinder herum angepaßt ist, um die Platte (8) in einem gewissen Abstand von dem Flansch zu halten.
5. Eine Kofferraumklappe, die eine Montieranordnung nach irgendeinem der vorstehenden Ansprüche umfaßt.

Revendications

1. Arrangement de montage destiné au montage d'une serrure sur un panneau de chemise ou d'enveloppe extérieure de véhicule, l'arrangement comprenant un cylindre (9) de serrure, un trou dans le panneau de chemise (4) ou d'enveloppe extérieure destiné à recevoir le cylindre (9) de serrure et une patte (1) qui présente une portion de pied (3) fixée au panneau de chemise ou d'enveloppe extérieure (4) à une certaine distance de la surface interne de la portion dudit panneau de chemise ou d'enveloppe extérieure sur lequel ledit trou est fourni, et une portion droite (5), caractérisé en ce que l'arrangement inclut une plaque (8) montée sur le cylindre (9) et fixée contre toute rotation par rapport au cylindre, la plaque étant placée derrière la patte (1), de sorte que l'engagement de la plaque contre la patte résiste à des forces d'extraction exercées sur le cylindre, et dans lequel la portion droite (5) de la

patte (1) est munie de trous espacés (6, 7) et la plaque (8) présente des tourillons (14, 15) correspondants qui s'adaptent dans les trous de manière à résister aux forces de torsion exercées sur le cylindre (9).

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2. Arrangement selon la revendication 1, caractérisé en ce que la plaque (8) présente un trou non circulaire (16) et le cylindre (9) présente une partie non circulaire correspondante qui s'adapte à travers le trou, de sorte que la plaque ne peut pas tourner par rapport au cylindre, l'arrangement comprenant également une attache de retenue (10) destinée à s'adapter dans une rainure (20) sur l'extrémité du cylindre afin de retenir la plaque sur le cylindre.
3. Arrangement selon la revendication 2, caractérisé en ce que l'attache de retenue est engagée dans la rainure sur environ 120° d'arc.
4. Arrangement selon l'une des revendications précédentes, caractérisé en ce que le cylindre (9) présente une bride (17) s'étendant radialement en son extrémité de réception de la clé, et un manchon d'écartement tubulaire (11) est fixé autour du cylindre pour écarter la plaque (8) de la bride.
5. Capot de compartiment à bagages incluant un arrangement de montage selon l'une des revendications précédentes.

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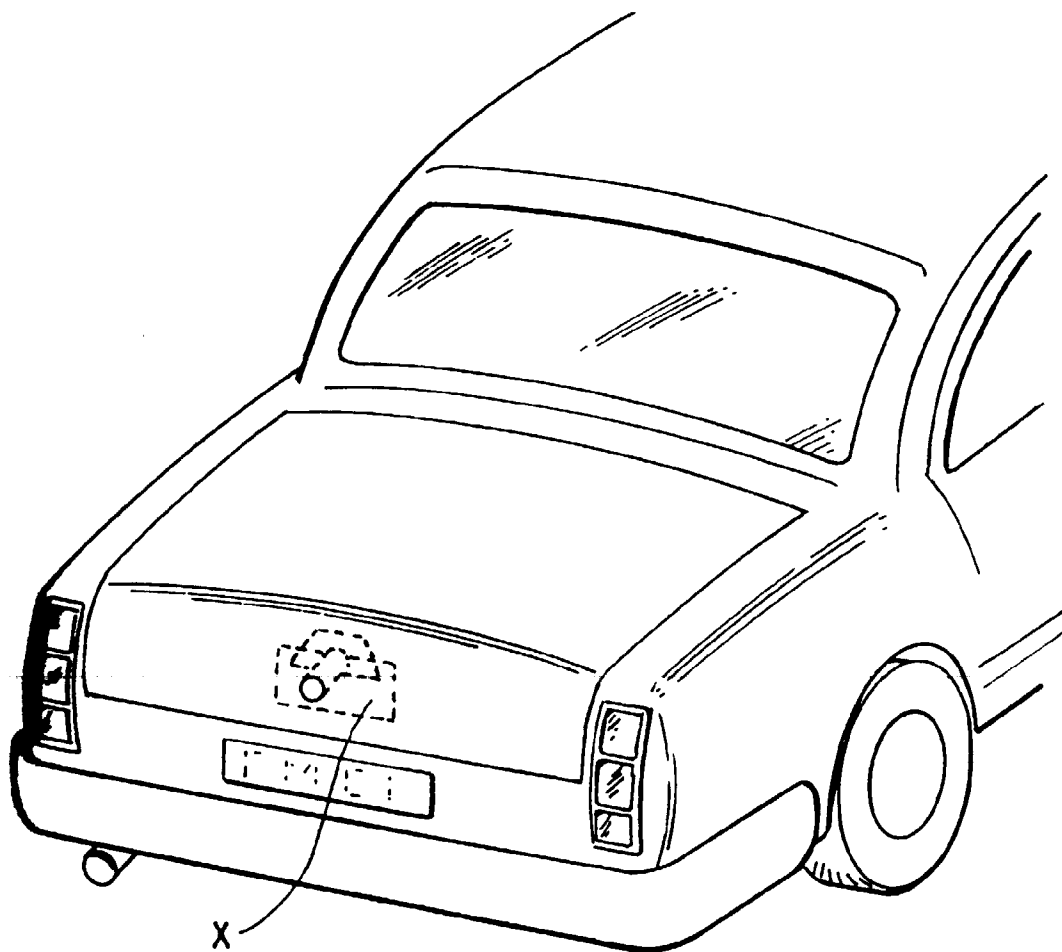


Fig. 1

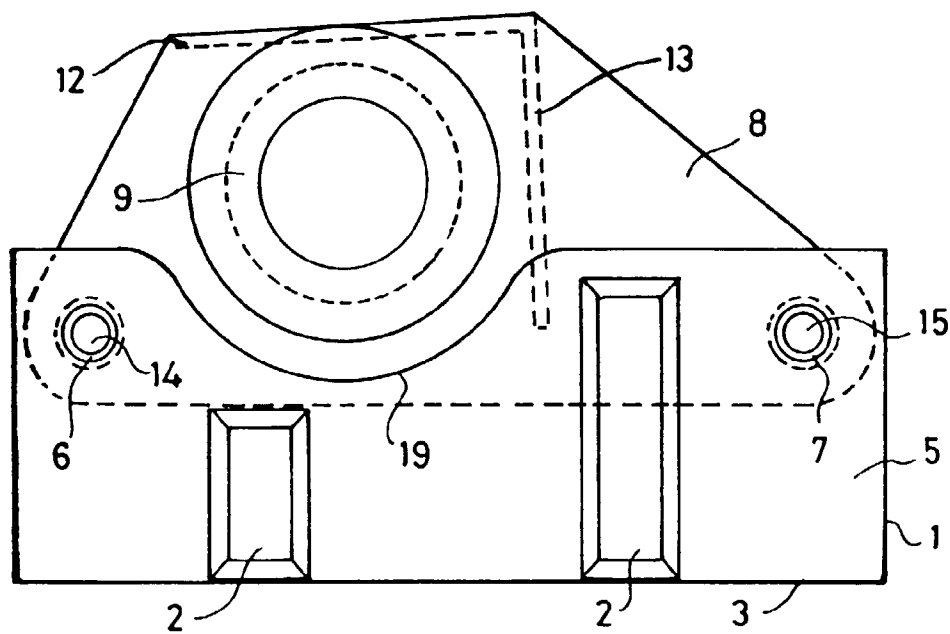
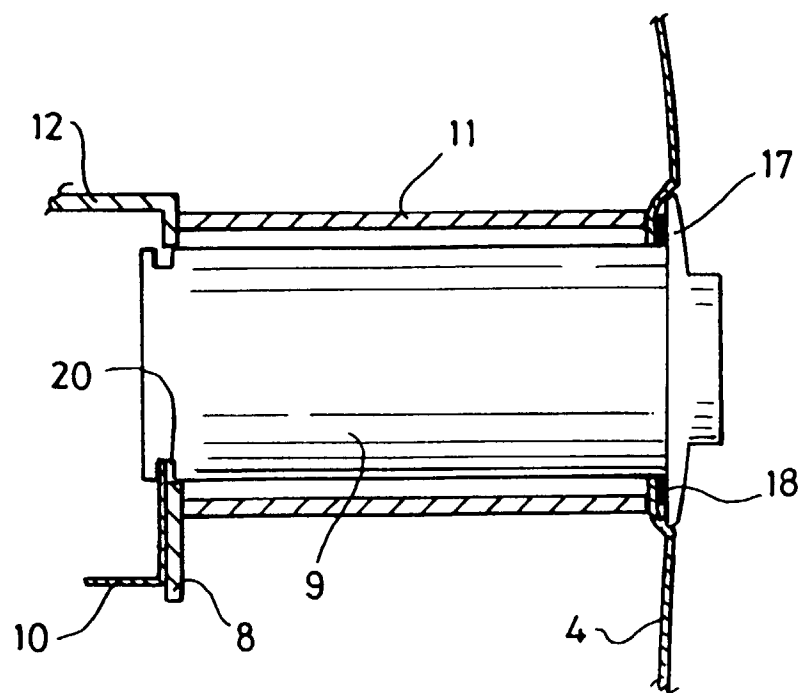
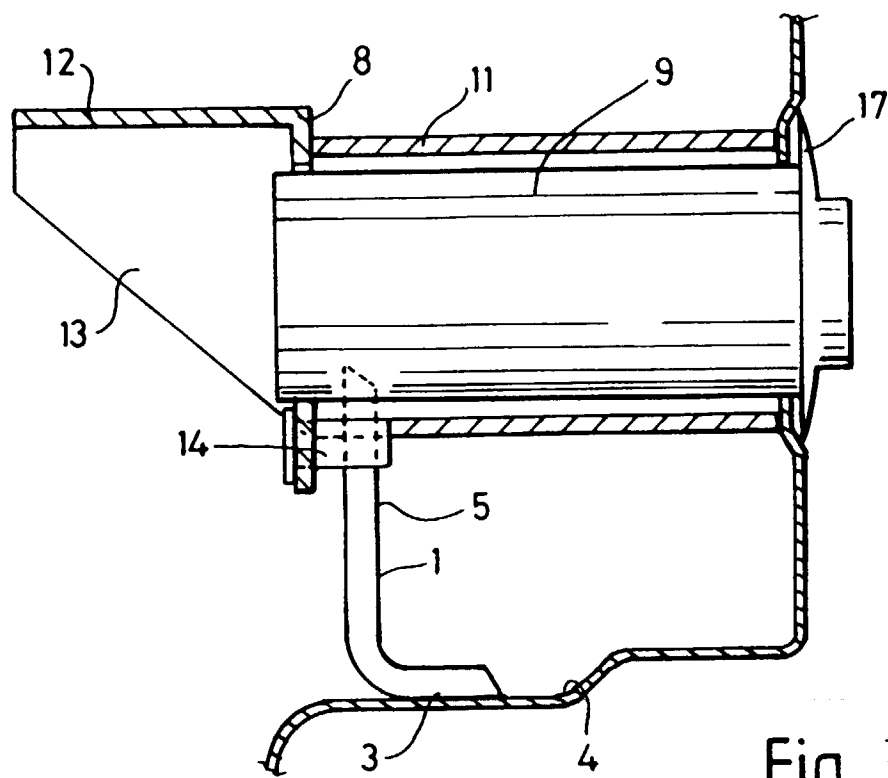


Fig. 2



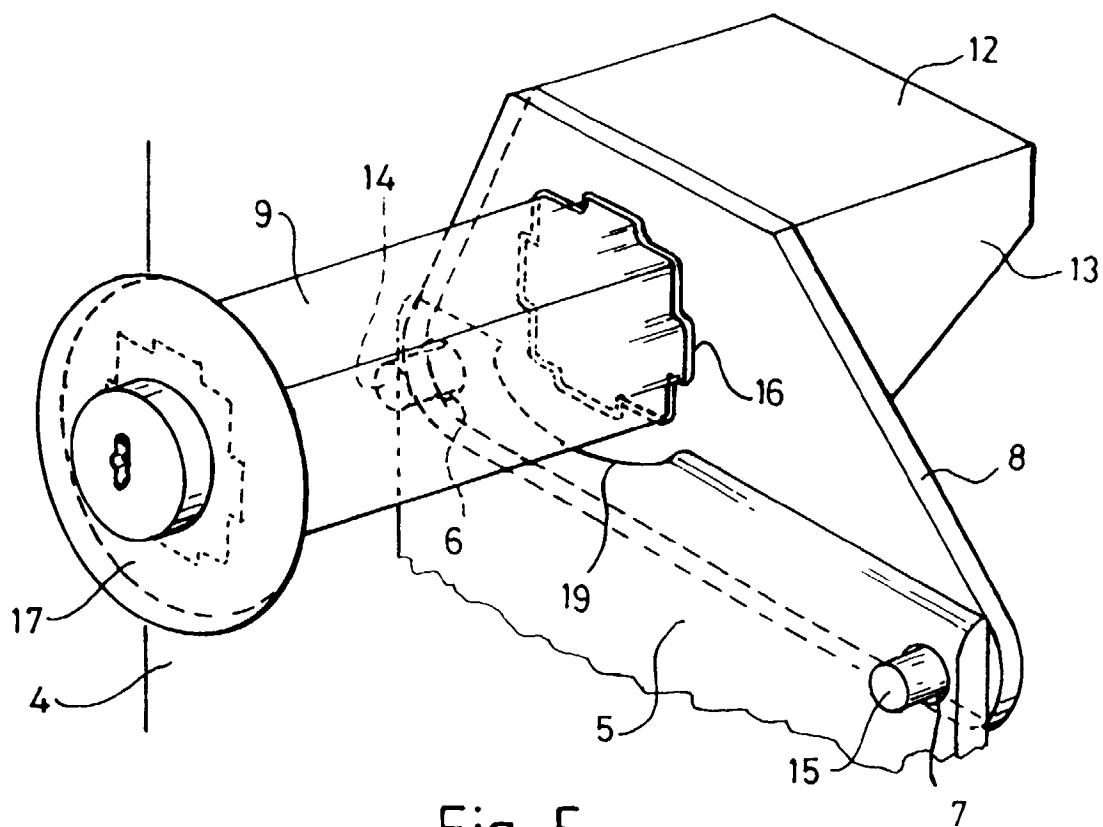


Fig. 5

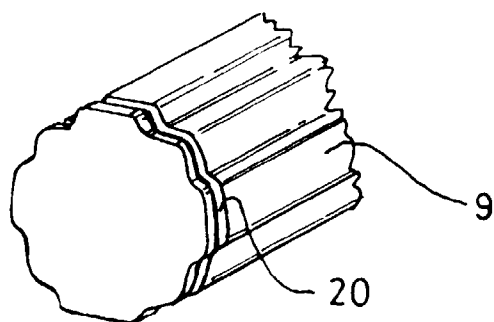


Fig. 6

