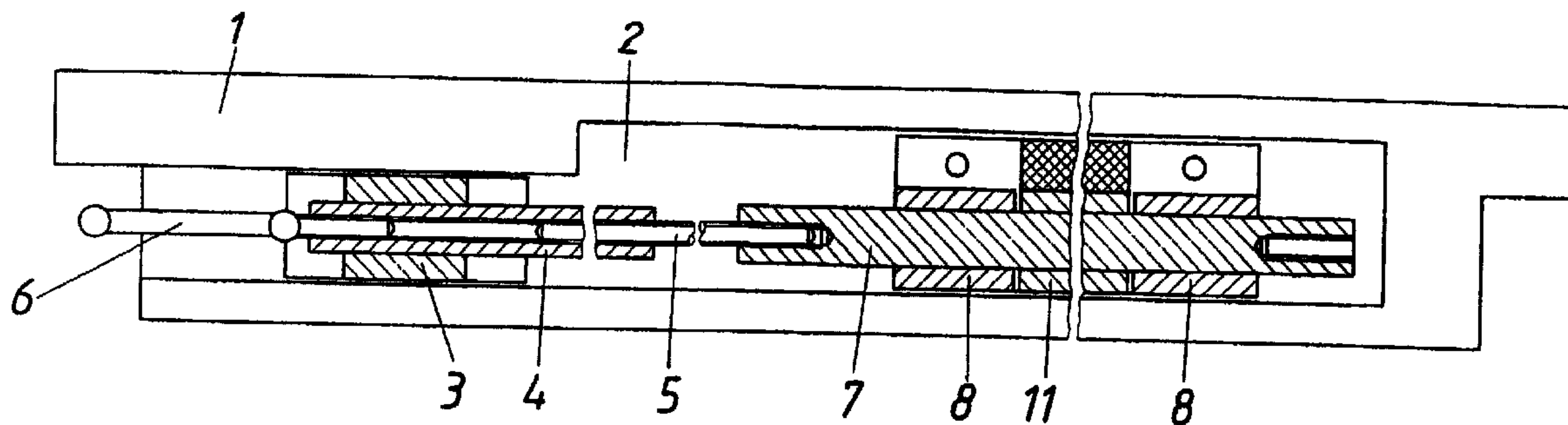




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(54) Titre : ARRETOIR DE PORTES
 (54) Title: STOPPER FOR BRAKING A DOOR



(57) Abrégé/Abstract:

The aim of the invention is to create a stopper for doors (1) which presents a brake element (11) in the floor area of the door (1) and is characterized in that it is adjustable, functions reliably and can be fully integrated into a door (1). To this end the brake element (11) is adjustably mounted in the door (1) and by way of an actuator controlled by the movement of the door can be moved from a retracted normal position, in which it is situated when the door is closed, forward into a braking position in which it projects beyond the lower edge of the door when the door is open.

Abstract:**A stopper for doors**

In order to create a stopper for doors (1) with a brake element (11) disposed in the floor area of the door (1) which is characterized by its adjustability and functional reliability and ability to be completely integrated in a door (1), the brake element (11) is guided adjustably in the door (1) and by way of an actuator controlled by the movement of the door can be moved from a retracted normal position, in which it is situated when the door is closed, and forward into a braking position in which it projects beyond the lower edge of the door when the door is open.

(Fig. 1)

A stopper for doors

The invention relates to a stopper for doors with a brake element in the floor area.

In order to secure doors it is known (WO 92/03630 A) to provide fixing elements which are mounted on the door leaf in the zone of the lower edge of the door with which a door can be tightly clamped at any desirable opening angle by wedging with the floor. The wedging or release of the door is performed by manual lowering or lifting of an eccentric pulley, so that these fixing elements are not suitable for limiting the opening angle of a door and cannot be integrated in a door leaf.

In order to prevent any striking of doors against walls, furniture or other obstructions it is known further to mount brake or stop elements made of rubber or plastic on the floor or the wall. Such stoppers are fixedly mounted and are clearly visible and make the cleaning of floors and the like more difficult as a result of their projecting stopper bodies.

The invention is therefore based on the object of providing a stopper of the kind mentioned above which is characterized by its adjustability and reliable function and its ability to be integrated completely in a door.

This object is achieved by the invention in such a way that the brake element is adjustably mounted in the door and by way of an actuator controlled by the movement of the door can be moved from the retracted normal position when the door is closed forward to a braking position in which it projects beyond the lower edge of the door when the door is open.

As a result of the cooperation of brake element and actuator, the brake element is swiveled depending on the opening width of the door from the normal position to the brake position or from the brake position to the normal position and thus the door is either braked in a predetermined opened position or released for

movement. In this process the brake element and the actuator, due to their arrangement in the zone of the lower edge of the door, remain substantially invisible and there is no stop or the like which is fixedly mounted in the floor or on the wall.

Advantageously, the actuator consists of a connecting link which is held in a slidable adjustable way along the lower edge of the door for the purpose of swivelably adjusting the brake element which is guided in a non-displaceable manner in the longitudinal direction and of a rod assembly for the articulation of the connecting link on the door jamb or the floor, which articulation is distanced from the swiveling axis of the door. The support of the rod assembly which is eccentric to the swiveling axis of the door causes during a movement of the door a relative displacement of the connecting link with respect to the door, as a result of which the brake element can be adjusted in a reliable manner by means of the connecting link.

A simple adjustable construction is obtained when the rod assembly consists of a link joint, a threaded rod and a tube with an inside thread for longitudinal adjustment, since the connecting link can be displaced relative to the brake element with the help of this rod assembly and can thus be adjusted to a certain braking zone of the door.

If the rod assembly consists of link joint, a threaded rod and a helical spring, which helical spring comprises an end section which is wound winding after winding and an end section with mutually spaced windings and is screwed onto the threaded rod with its end section which is wound winding after winding and is articulated on the connecting link with its other end section, the rod assembly can be longitudinally adjusted not only by screwing the threaded rod and the helical spring, but the helical screw also additionally allows the compensation of imprecisions in mounting and movements between the connecting link and threaded rod and a damping of the occurring movement jolts during the braking.

If the connecting link is provided with a longitudinal groove with a widening in the zone of the brake element and if the brake element engages in the groove with a guide nose it is ensured that the brake element will come to bear rapidly and without sliding on the floor by a swiveling movement caused by gravity and the spring power and that it is able to flip back directly from its braking position in the direction of the normal position during the closure of the door as a result of the runway produced by the widening.

The subject matter of the invention is shown by way of examples in the drawings, wherein:

Fig. 1 shows a stopper in accordance with the invention as built into the door in a schematic, partially sectional bottom view;

Figs. 2 and 3 show a connecting link in a longitudinal and face view;

Figs. 4 and 5 show a bearing block for said connecting link in a longitudinal view and in a cross-sectional view;

Figs. 6 through 10 show the brake element of the stopper in different operational positions and embodiments;

Figs. 10 and 11 show the actuator of the stopper in an opened and closed door, and

Fig. 13 shows a modified embodiment of a stopper in a partially sectional bottom view.

A brake stopper for doors 1 comprises a brake element 11 provided with a brake lining 12 and an actuator for the brake element 11. The actuator consists of a connecting link 7 guided in bearing blocks 8 for the connecting link and a longitudinally adjustable rod assembly made of a tube 4 provided with an internal thread, a threaded rod 5 and articulation piece 6. The stopper is inserted or

screwed into a milled portion or recess 2 of the bottom side 1 of the door leaf. Connecting link 7 is provided with a longitudinal groove 9 and is guided by the two bearing blocks 8 which are seated on a common base plate along the lower edge of the door in an adjustable sliding manner by sliding elements or pins 10 of the bearing blocks 8. The connecting link 7 carries the brake element 11 between the bearing blocks 8, with the longitudinal groove 9 of the connecting link 7 being provided with a widening 14 in the zone of the brake element 11 and the brake element 11 engaging in the longitudinal groove 9 with a guide nose 13. The articulation piece 6 is articulated at the one end on a door jam 15 spaced from the swiveling axis of the door 1 and at the other end with the tube 4 guided by a bearing block 3. Connecting link 7 and tube 4 are coupled in a longitudinally adjustable manner by means of the threaded rod 5.

The stopper 11, which may comprise one or also several brake elements 11 (figs. 6 through 8 and figs. 9 and 10), is situated in its retracted normal position when the door is closed (fig. 12). When the door is opened the door leaf moves away increasingly from the point of articulation of the articulation piece (fig. 11) with increasing opening angle and thus pulls the connecting link 7 relatively in the direction towards the door jamb 15. From an opening angle which is adjustable by means of the threaded rod, the brake element is released by the widening 14 of the longitudinal groove 9 of the connecting link, flips downwardly with a rotation about the longitudinal axis of the connecting link, and brakes the door. The downward swivel of the brake element 11 from its normal position when the door is closed to its braking position when the door is opened occurs by the own weight or a spring pretensioning of the brake element 11. Conversely, the brake element 11 is flipped back during the closing of the door in the direction towards the normal position by the runway formed by the widening 14, which prevents any undesirable sliding or slipping of the brake element on the floor.

According to a slightly modified embodiment of the invention (fig. 13) a helical screw 17 is inserted in the rod assembly instead of tube 4, which helical spring 17 is screwed onto the threaded rod 5 with an end section wound winding after winding and engages with an end section comprising mutually spaced windings in

a groove of the connecting link 7. Said helical spring 17 also allows a longitudinal adjustment of the rod assembly. It also allows a compensation of imprecisions in the movement and a damping of any occurring impact loads during the braking.

Claims:

1. A stopper for doors (1) with a brake element (11) arranged in the floor zone of the door (1), characterized in that the brake element (11) is mounted adjustably in the door and by way of an actuator controlled by the movement of the door can be moved from a retracted normal position, in which it is situated when the door is closed, forward into a braking position in which it projects beyond the lower edge of the door when the door is open.
2. A stopper as claimed in claim 1, characterized in that the actuator consists of a connecting link (7) which is held in a slidable adjustable way along the lower edge of the door for the purpose of swivelably adjusting the brake element (11) which is guided in a non-displaceable manner in the longitudinal direction and of a rod assembly for the articulation of the connecting link (7) on the door jamb (15) or the floor, which articulation is distanced from the swiveling axis of the door.
3. A stopper as claimed in one of the claims 1 or 2, characterized in that the rod assembly consists of a link joint (6), a threaded rod (5) and a tube (4) with an inside thread for longitudinal adjustment.
4. A stopper as claimed in one of the claims 1 or 2, characterized in that the rod assembly consists of link joint (6), a threaded rod (5) and a helical spring (17), which helical spring (17) comprises an end section which is wound winding after winding and an end section with mutually spaced windings and is screwed onto the threaded rod with its end section which is wound winding after winding and is articulated on the connecting link with its other end section.
5. A stopper as claimed in one of the claims 1 to 4, characterized in that the connecting link (7) is provided with a longitudinal groove (9) with a widening

(14) in the zone of the break element (11) and the brake element (11) engages in the groove with a guide nose (13).

1/4

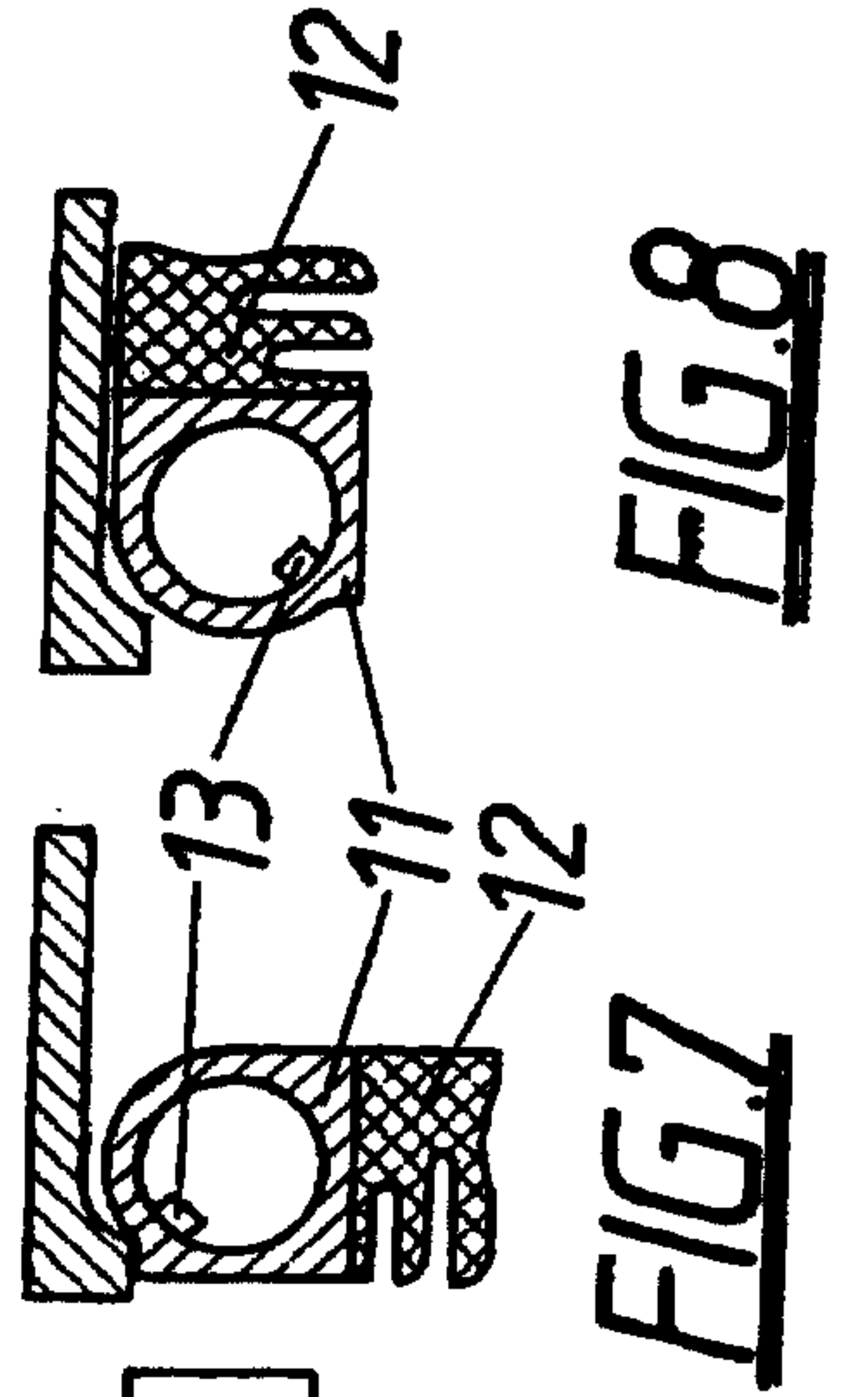
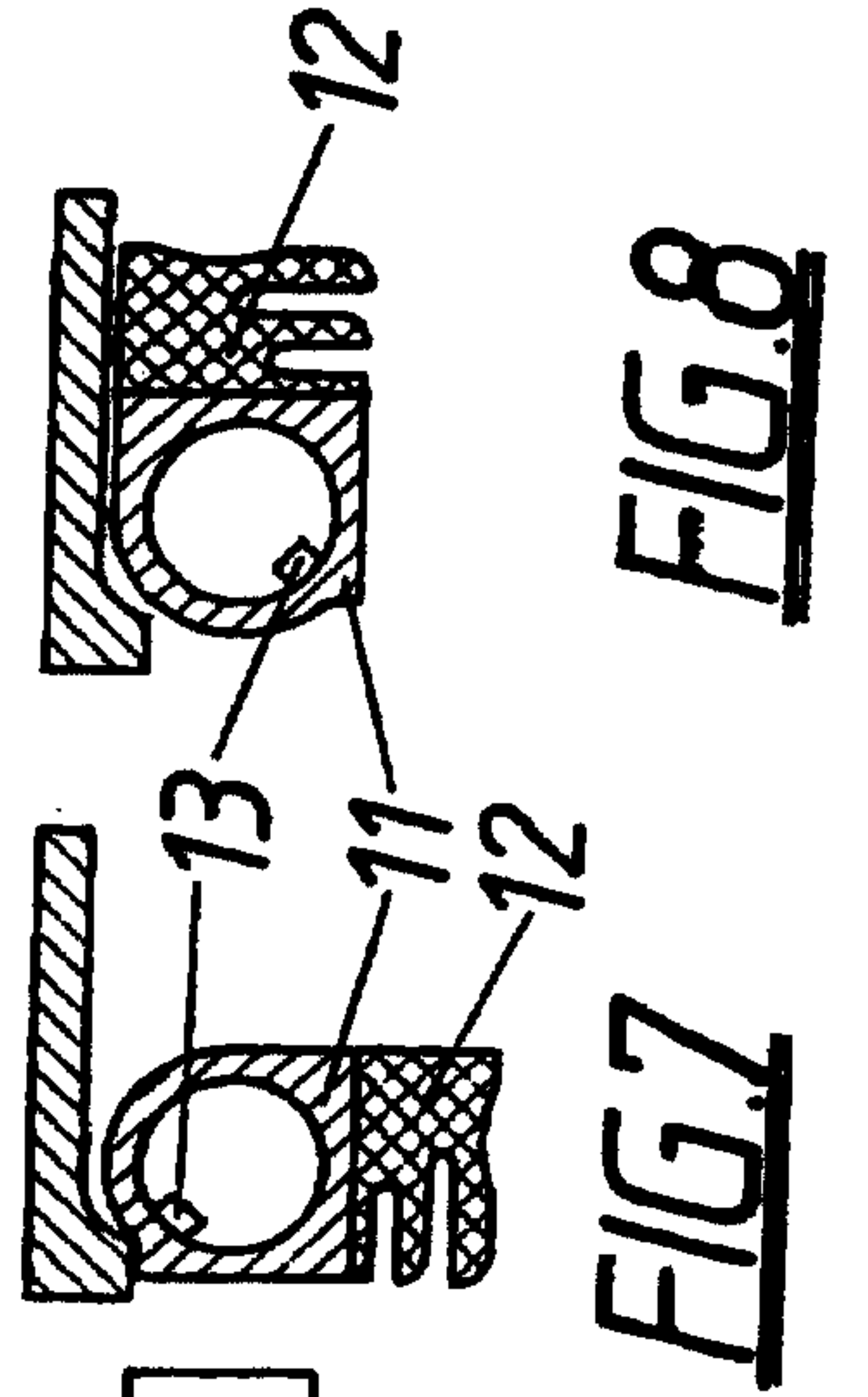
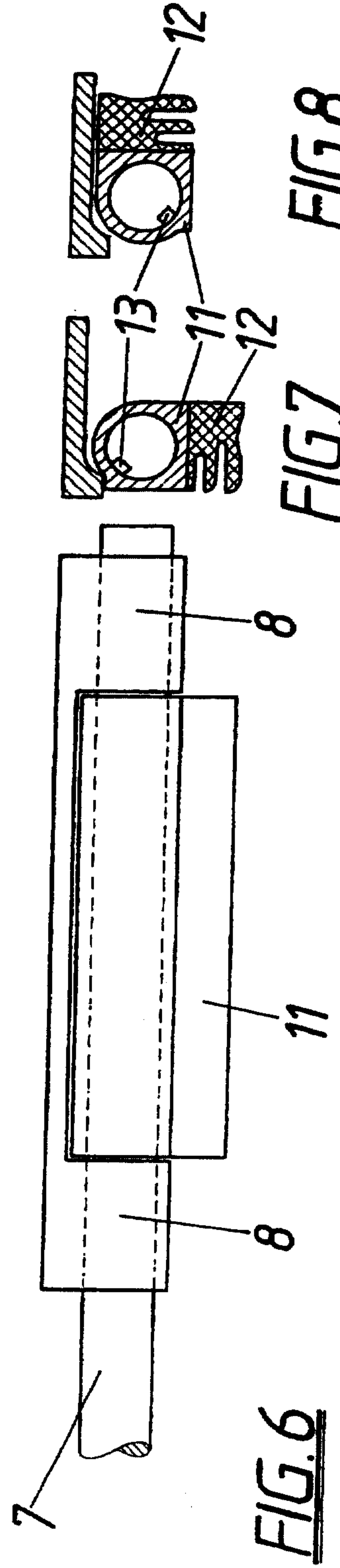
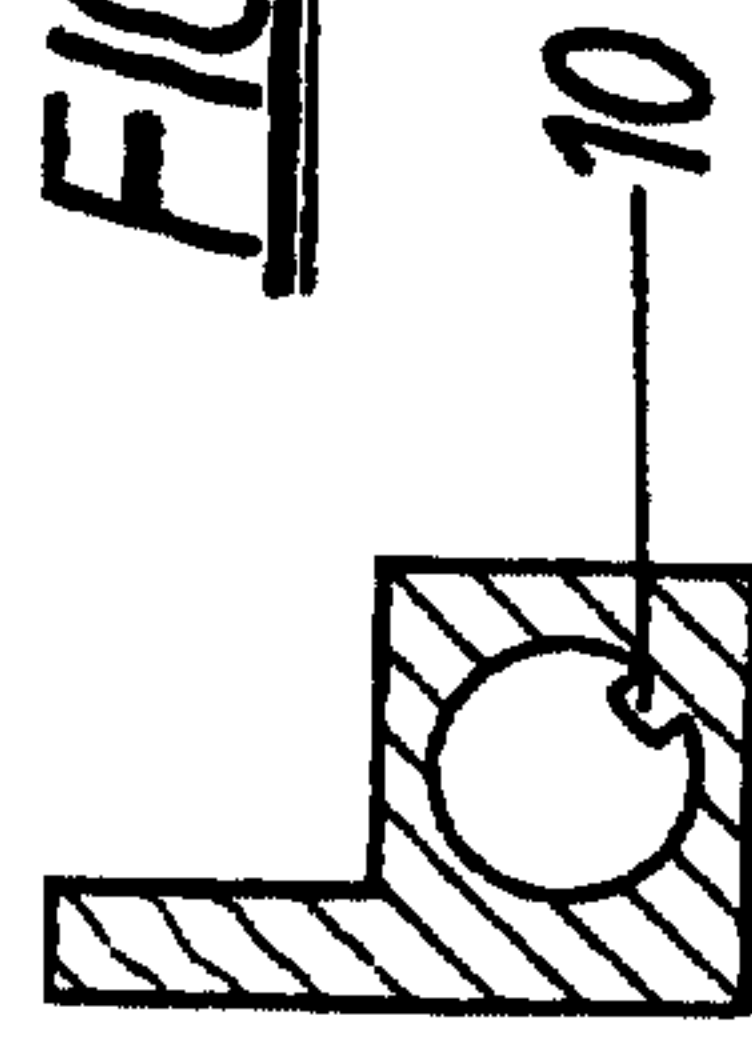
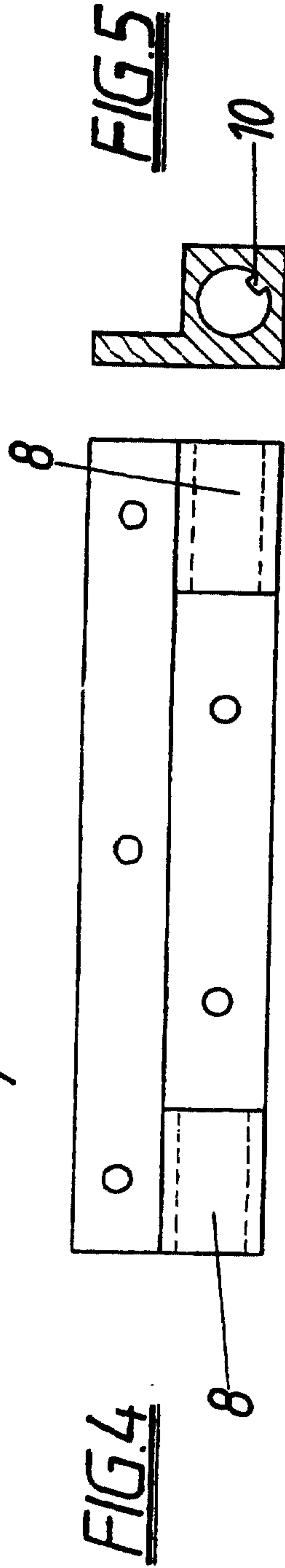
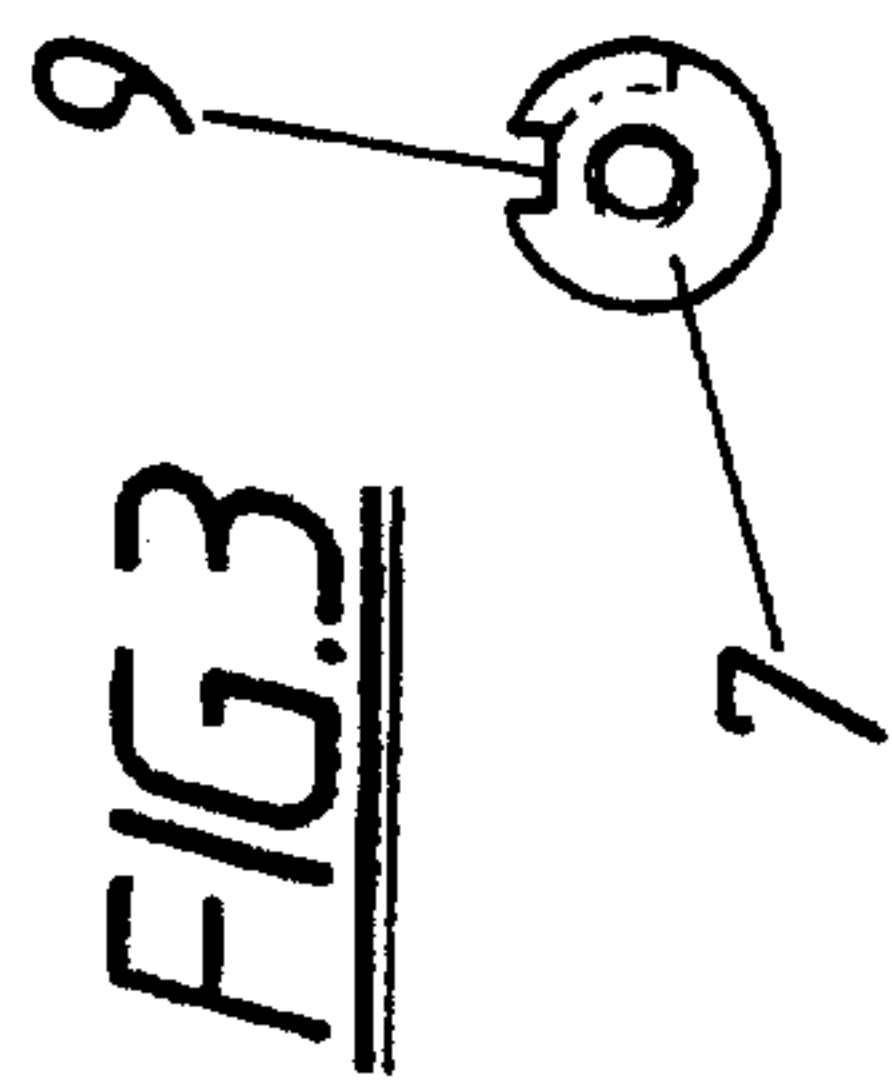
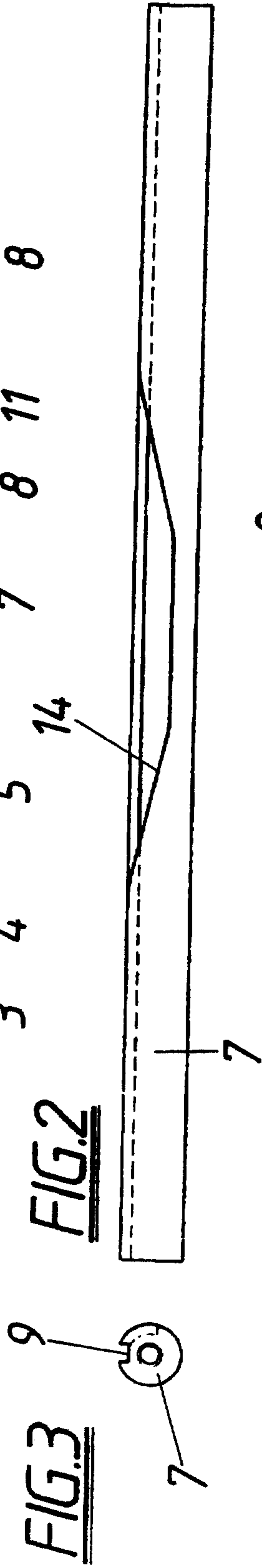
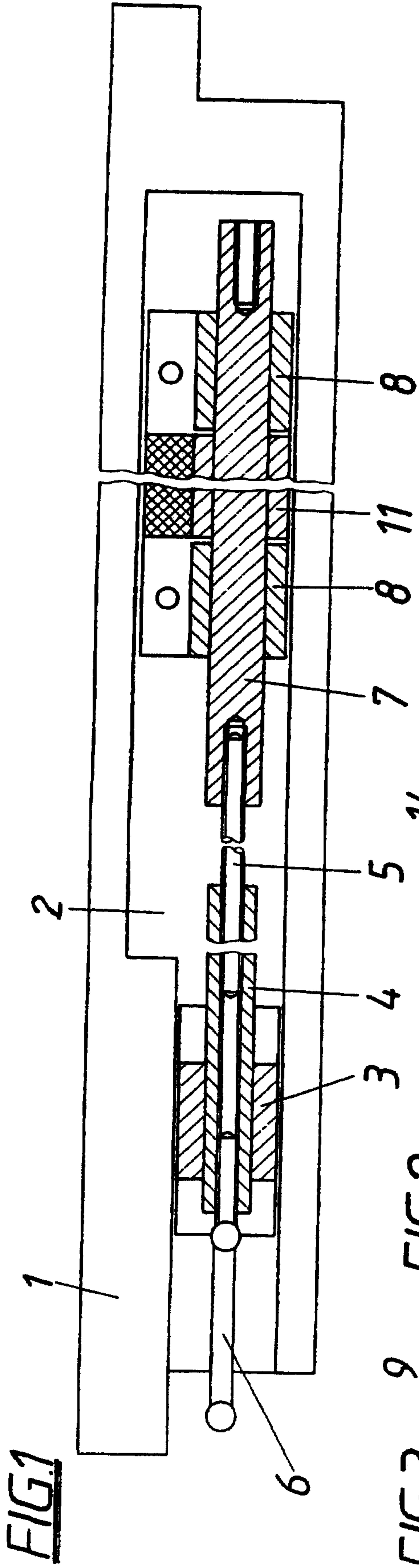


FIG.9

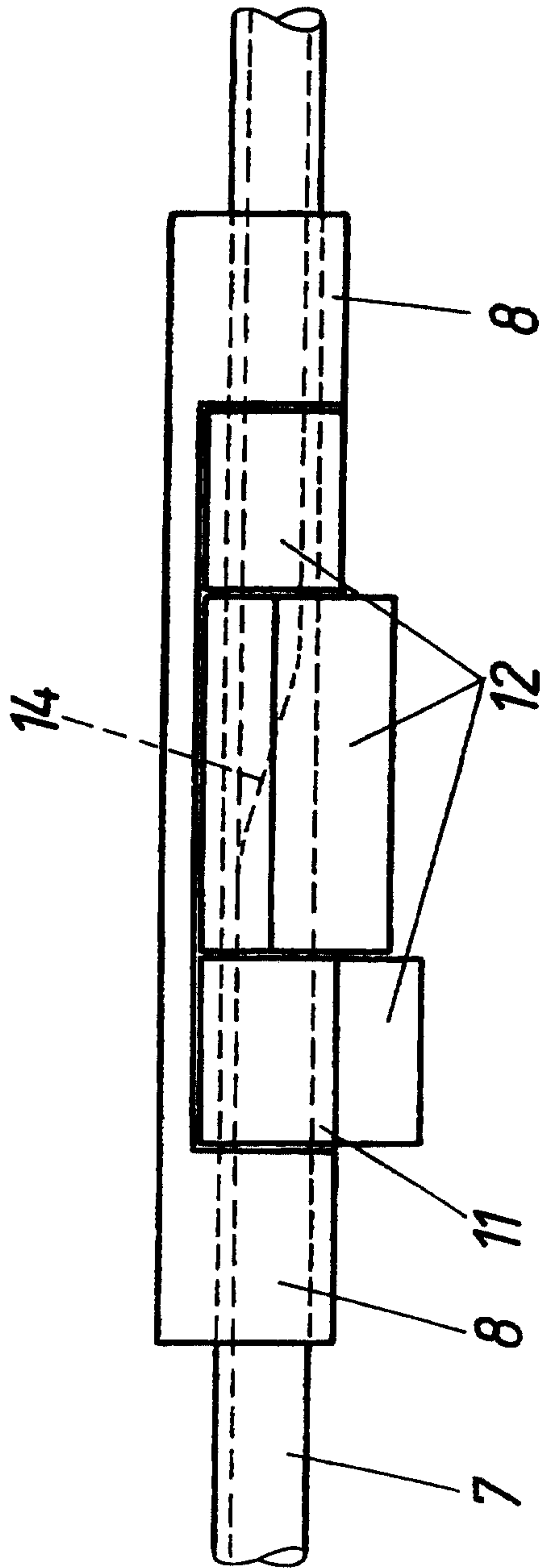


FIG.10

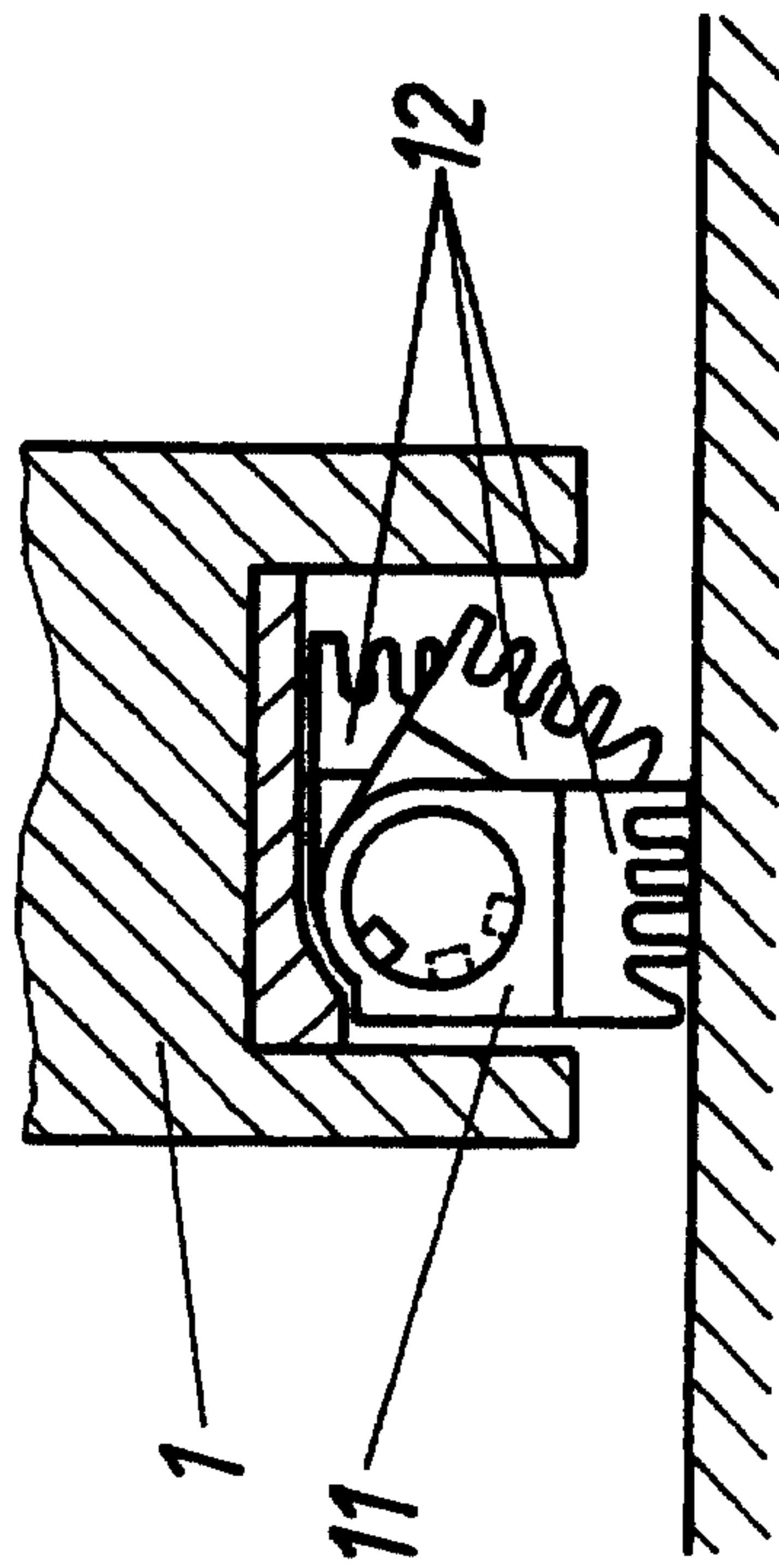


FIG.11

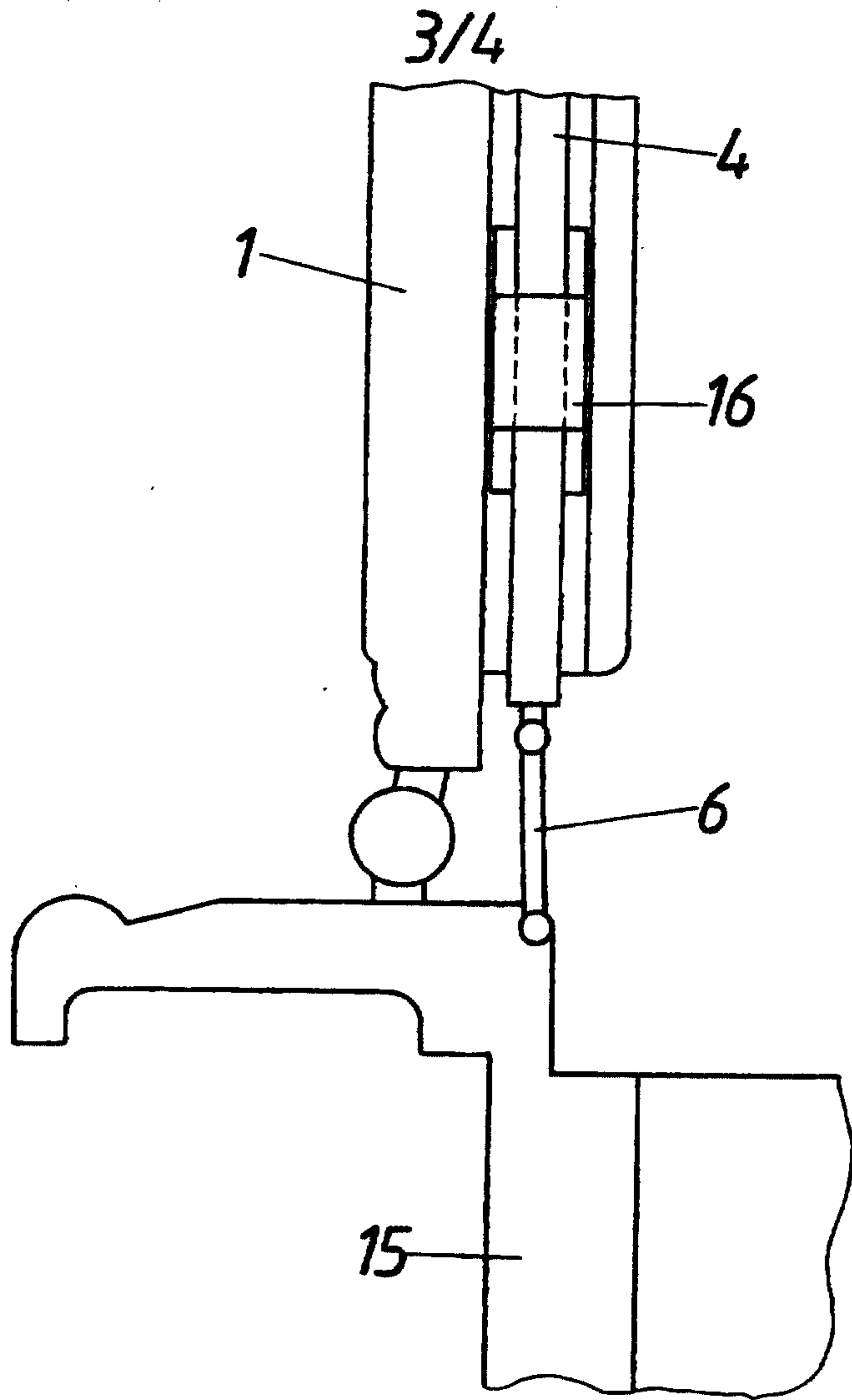


FIG.12

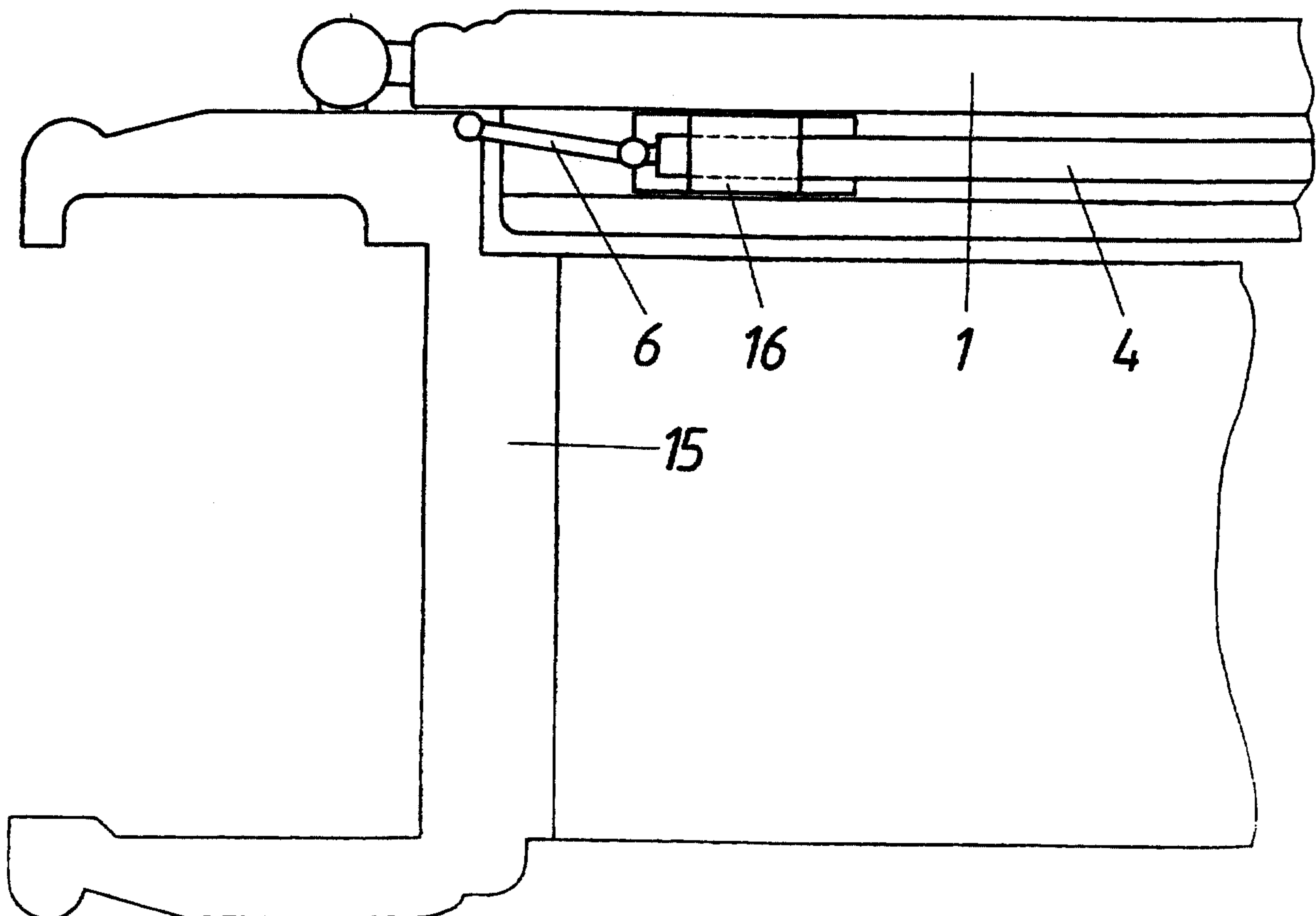


FIG.13

