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Built-in safety device and key for a safety lock

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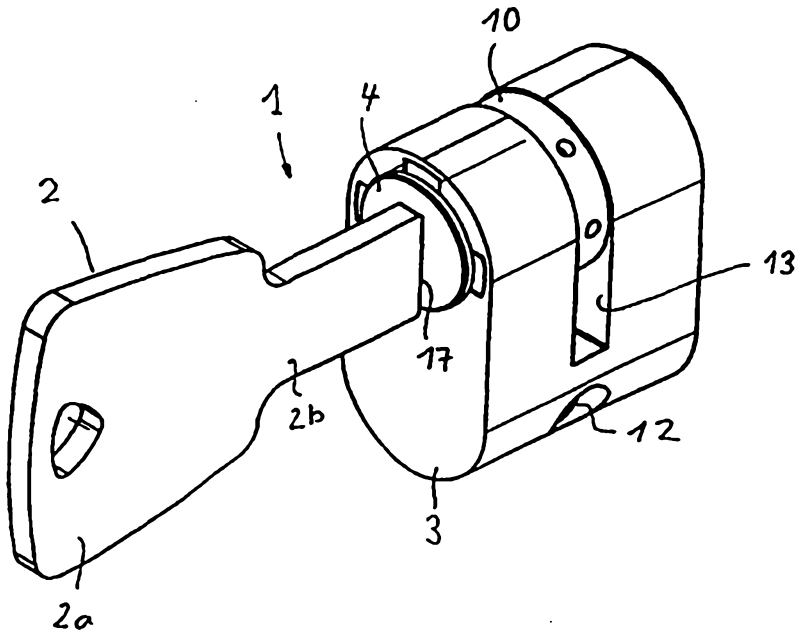
(54) Title: BUILT-IN SAFETY DEVICE AND KEY FOR A SAFETY LOCK

(54) Bezeichnung: EINBAUSICHERUNG UND SCHLÜSSEL FÜR EIN SICHERHEITSSCHLOSS

(57) Abstract

The invention relates to a built-in safety device comprising a housing (3) and a rotor (4) mounted therein. Tumblers (8) are mounted in the housing (3) and in the rotor (4). The maximal length (A) of the built-in safety device (1) is approximately 40 mm, and the effective part (2c) of the key (2) is essentially as long as the rotor (4). In addition, the rotor (4) is constructed as one piece and can be operated from both sides thereof. The inventive built-in safety device can be installed in a mortise lock more easily than a cross-key bit safety device and permits the production of a locking system.



(57) Zusammenfassung

Die Einbausicherung weist ein Gehäuse (3) und einen in diesem gelagerten Rotor (4) auf. Im Gehäuse (3) und im Rotor (4) sind Zuhaltungen (8) gelagert. Die Länge (A) der Einbausicherung (1) beträgt höchstens etwa 40 mm und der wirksame Teil (2c) des Schlüssels (2) ist im wesentlichen so lang wie der Rotor (4). Zudem ist der Rotor (4) einstückig ausgebildet und von seinen beiden Seiten bedienbar. Die erfindungsgemässe Einbausicherung ist in einem Einsteckschloss wesentlich einfacher montierbar als eine Kreuzbartsicherung und ermöglicht den Aufbau einer Schliessanlage.

Cylinder Lock Assembly and Key for a Safety Lock

The invention relates to a cylinder lock assembly and a key according to the precharacterising portion of claim 1.

The reference to any prior art in this specification is not, and should not be taken as, an acknowledgment or any form of suggestion that that prior art forms part of the common general knowledge in Australia.

Cylinder lock assemblies in the form of cross bit assemblies have been known for a long time. Such cross bit assemblies are installed in the lock case and secured by screws. Installation is comparatively time consuming while locking safety is comparatively modest. It is thus the object of the invention to create a cylinder lock assembly which essentially can be inserted in any usual commercial lock, without requiring any rework.

This object is met according to claim 1. Essentially, the cylinder lock assembly according to the invention is similar to a rotary locking cylinder, except that it is significantly shorter than a rotary locking cylinder and that it comprises a through-rotor which can be operated from either side using a key. The length of the effective part of the key is essentially the same as that of the rotor.

The cylinder lock assembly according to the invention provides for two escutcheon plates or rosettes, each comprising a rotatable sleeve as a key guide. This key guide guides the key positively into the key channel of the cylinder lock assembly. The key guide is rotatably held in the escutcheon plate or the rosette; during the locking action it rotates together with the key. One significant advantage of the cylinder lock assembly consists of the assembly being invisible from the outside and, due to its

short length, not protruding, making it resistant to breaking off. Thus the length of the cylinder lock assembly is less than the thickness of the door leaf.

The cylinder lock assembly according to the invention can have any usual commercial profile, for example the European profile, the Swiss profile or an English or Scandinavian oval profile. The cylinder lock assembly according to the invention provides an advantage in that the driver can be arranged either symmetrically or asymmetrically. This is possible in particular due to the through-rotor. Such asymmetric arrangement is advantageous in the case of rebated doors. Furthermore, the cylinder lock assembly according to the invention makes it possible to establish a small locking system, for example comprising several apartment keys and one central key. It is also possible to provide keys which only permit operation of the cylinder lock assembly from the left or from the right. Preferably the followers are arranged such that locking from the outside differs from locking from the inside. In this case as has been mentioned it is possible to have a key which only locks from the outside and it is possible to have a further key which only locks from the inside. Of course such a small locking system also provides the option of a main key which locks both from the inside and from the outside.

Preferably, slides for the followers are held in the housing. These slides are perforated differently and preferably directly supported at the driver. This provides the significant advantage of any knocking out of the rotor being largely impossible. If the slides are perforated differently, by inserting such slides, hole patterns can be created which result in new locking arrangements.

It is important that the cylinder lock assembly is always significantly shorter than the width of the door in which it will be installed. Preferably, the cylinder lock assembly is approx. 5 to 10 mm shorter. In this case the cylinder lock assembly does not protrude at the exterior of the door and correspondingly cannot be gripped and broken off. This significantly increases the safety provided by any door. The same is also possible in the case of rebated doors since in this case the driver can be arranged asymmetrically.

Further advantageous features are presented in the dependent claims, the description below and the drawing.

Below, one embodiment of the invention is shown in more detail by means of the drawing, as follows:

Figure 1 shows a cylinder lock assembly according to the invention, with a key inserted;

Figure 2 provides a further view of the cylinder lock assembly with key;

Figure 3 provides a further view of the cylinder lock assembly;

Figure 4 is an enlarged partial view according to Figure 3;

Figure 5 is a sectional view of a cylinder lock assembly according to the invention;

Figure 6 is a partial view of a door with a cylinder lock assembly installed and with a pair of handles;

Figure 7 is a further partial view of the door according to Figure 6;

Figure 8 provides a diagrammatic view of a cylinder lock assembly installed in a lock case, with symmetrical arrangement of the driver;

Figure 9 corresponds to Figure 8, except that the arrangement of the driver is asymmetrical with the door being rebated; and

Figures 10a to 10d show keys according to the invention, of a locking system of the cylinder lock assembly according to the invention.

The cylinder lock assembly shown in Figures 1 and 2 comprises a housing 3 in which a single-piece rotor 4 is rotatably held. The rotor 4 comprises a continuous key channel 17 into which the effective part 2c of a safety key 2 is inserted. Between the effective part 2c and the grip part 2a there is a guide stay 2b. The function of this guide stay 2b is explained in more detail later. The rotor 4 is secured by a clamping ring 15. The lower part of the housing 3 comprises a double vent screw borehole 12. A driver 10 is attached to the rotor 4, said driver 10 being held in a slot 13 of the housing 3.

As shown in Figures 3 and 4, three slides 6 are inserted in the housing 3, said slides accommodating the housing pins 8 of the followers (not shown) which are known per se. These followers are spring loaded in the known way; they interact with control surfaces in the effective part 2c of the key 2.

According to Figure 5, to rotationally secure the driver 10, the rotor 4 comprises a borehole 33 with an inserted sleeve 24 which accommodates a compression spring 23 as well as a securing pin 22. This securing pin 22 interacts with a stepped borehole 21 of the driver 10. Three such boreholes 21, spaced apart, are provided; they can selectively be used for various rotational positions of the driver 10. In this case, the middle borehole 21 is used.

Figure 6 shows a door 25 which comprises a usual mortise lock 26. This mortise lock 26 shows the usual bolt 29 as well as a borehole 27 for a double vent screw. The door 25 comprises the usual pair of handles comprising two individual handles 28 as well as two escutcheon plates 30. As shown, the cylinder lock assembly 1 is inserted in the lock case 26 where it is attached by means of the double vent screw (not shown). It is essential that the length A, shown in Figure 2, of the cylinder lock assembly 1, is such that the cylinder lock assembly 1 protrudes only slightly on both sides of the lock case 26, as shown in Figure 6. Thus the length of the cylinder lock assembly 1 is significantly less than the width of the door 25. Thus the cylinder lock assembly 1 is neither visible nor directly accessible. It can therefore not be gripped by means of a tool and broken off.

The key 2 penetrates a guide bush 31 which during insertion guides the key 2 by the guide stay 2b. The guide bush 31 is rotatably held in a borehole 34 of a door plate 30. The door plate 30 may also be a rosette or similar. To accommodate the key 2, the guide bush 31 according to Figure 7 comprises a guide slot 32 extending across the entire depth of the guide bush 31. The guide bush 31 ensures that when the key 2 is inserted, it is guided into the key channel 17 of the rotor 4.

Figure 8 diagrammatically shows the arrangement of the cylinder lock assembly 1 in a door 25, in this case a blunt, i.e. non-rebated door. As is shown, the driver 10 is arranged symmetrically in relation to the mortise lock 26. Figure 9 shows a rebated door 25' whose mortise lock 26 is arranged asymmetrically. Correspondingly, the cylinder lock assembly 1' comprises a housing 3' in which the driver 10' is arranged asymmetrically. The asymmetric arrangement of the driver 10' makes it possible to install the cylinder lock assembly 1' so that on the outside it does not protrude from the door 25'. After installation of the escutcheon plates 30 or the rosettes (not shown), the cylinder lock assembly 3' is not visible from the outside and is not directly accessible.

Figures 10a to 10d show four keys 2, 2', 2" and 2''' of a small locking system. The grip parts 2a of the keys are not shown. According to Figure 10a each of the keys comprises an effective part 2c comprising two narrow sides 18 and two broad sides 19. The narrow sides 18 and 19 comprise boreholes 14, 15 and 16. These boreholes form control surfaces, with the depth of said boreholes varying; as usual, in this drawing the depth is indicated by numbers.

The key 2 shown in Figure 10a is an apartment key which allows operation of an associated cylinder lock assembly only from one side, for example from the left. The key 2' shown in Figure 10b is also an apartment key; it can operate the associated cylinder lock assembly 1 from the other side, i.e. for example from the right. The key 2" shown in Figure 10c is also an apartment key; it allows operation of the associated cylinder lock assembly 1 from both sides. Finally, Figure 10d shows a key 2''' which is a central key; it allows operation for example of a main entrance door as well as various apartment doors. Figures 10a to 10d show the symmetrical arrangement of the boreholes and borehole groups.

cylinder lock assembly 1 from both sides. Finally, Figure 10d shows a key 2' ' ' which is a central key; it allows operation for example of a main entrance door as well as various apartment doors. Figures 10a to 10d show the symmetrical arrangement of the boreholes and borehole groups.

The cylinder lock assembly 1 can thus be configured such that its two sides comprise different locking arrangements which differ in that they can be operated by different keys 2 or 2'. The two sides of the cylinder lock assembly 1 can however be designed such that their locking arrangements are the same so that they can be operated by the same key 2 or 2'. The key 2 can comprise two or four sets of boreholes with corresponding control surfaces. According to Figures 10c and 10d, these borehole sets are arranged symmetrically.

Throughout the specification and the claims which follow, unless the context requires otherwise, the word "comprise", and variations such as "comprises" or "comprising", will be understood to imply the inclusion of a stated integer or step or group of integers or steps but not the exclusion of any other integer or step or group of integers or steps.

It will be appreciated by persons skilled in the art that numerous variations and modifications will become apparent. All such variations and modifications which become apparent to persons skilled in the art, should be considered to fall within the spirit and scope of the invention as broadly hereinbefore described.

EDITORIAL NOTE - NO. 30221/99

This specification does not contain pages 7 and 8.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A cylinder lock assembly and key(s) for a safety lock, comprising a housing and a rotor held in said housing, and comprising followers arranged in several rows, said followers being held in the housing and in the rotor and a key channel arranged in the rotor, with an effective part of the key comprising control surfaces having to be inserted into said key channel so as to arrange the followers, with the length (A) of the cylinder lock assembly at most being approx. 40 mm and with the effective part of the key essentially being as long as the rotor, and with the rotor being made in one piece which can be operated from either side, with the key being a reversible key comprising two narrow sides and two broad sides with boreholes, as well as a guide stay between a grip part and its effective part.

2. A cylinder lock assembly according to claim 1, characterised in that the two sides comprise different locking arrangements.

3. A cylinder lock assembly according to claim 1 or 2, characterised in that one end of the rotor is secured by a clamping ring.

4. A cylinder lock assembly according to one of claims 1 to 3, characterised in that on its effective part the key in symmetrical arrangement comprises two sets or four sets of boreholes comprising control surfaces.

5. A cylinder lock assembly according to one of claims 1 to 4, characterised in that slides for housing pins are arranged in the housing .

6. A cylinder lock assembly according to one of claims 1 to 5, characterised in that the top of the housing comprises a slot for holding a driver and that said slot is arranged symmetrically or asymmetrically.

7. A cylinder lock assembly according to one of claims 1 to 6, characterised in that the driver comprises several boreholes, spaced apart, for accommodating a securing pin.

8. A cylinder lock assembly according to one of claims 1 to 7, characterised in that the housing is made in one piece.

9. A cylinder lock assembly and key(s) for a safety lock, the cylinder lock assembly being substantially as hereinbefore described with reference to the accompanying drawings.

10. A key for a cylinder lock assembly according to one of claims 1 to 9, characterised in that it comprises a guide stay between it's a grip part and a , with a shaft comprising control surfaces having to be inserted into said key channel, whereas the key being a reversible key comprising two narrow sides and two broad sides with boreholes, the guide stay.

11. A key according to claim 10, characterised in that it comprises two or four sets of boreholes in symmetrical arrangement.

12. A key for cylinder lock assembly according to one of claims 1 to 9, the key being substantially as hereinbefore described with reference to the accompanying drawings.

13. A pair of handles for a cylinder lock assembly according to one of claims 1 to 9, characterised in that it comprises cover parts with a rotatable guide bush being rotatably held in each of said cover parts, whereas that the guide bush comprises a guide slot which is made so as to correspond with a guide stay of the key.

A pair of handles for a cylindrical lock assembly according to one of claims 1 to 9, the pair of handles being substantially as hereinbefore described with reference to the accompanying drawings.

DATED this 29th Day of August, 2001

ERNST KELLER

By Their Patent Attorneys

DAVIES COLLISON CAVE

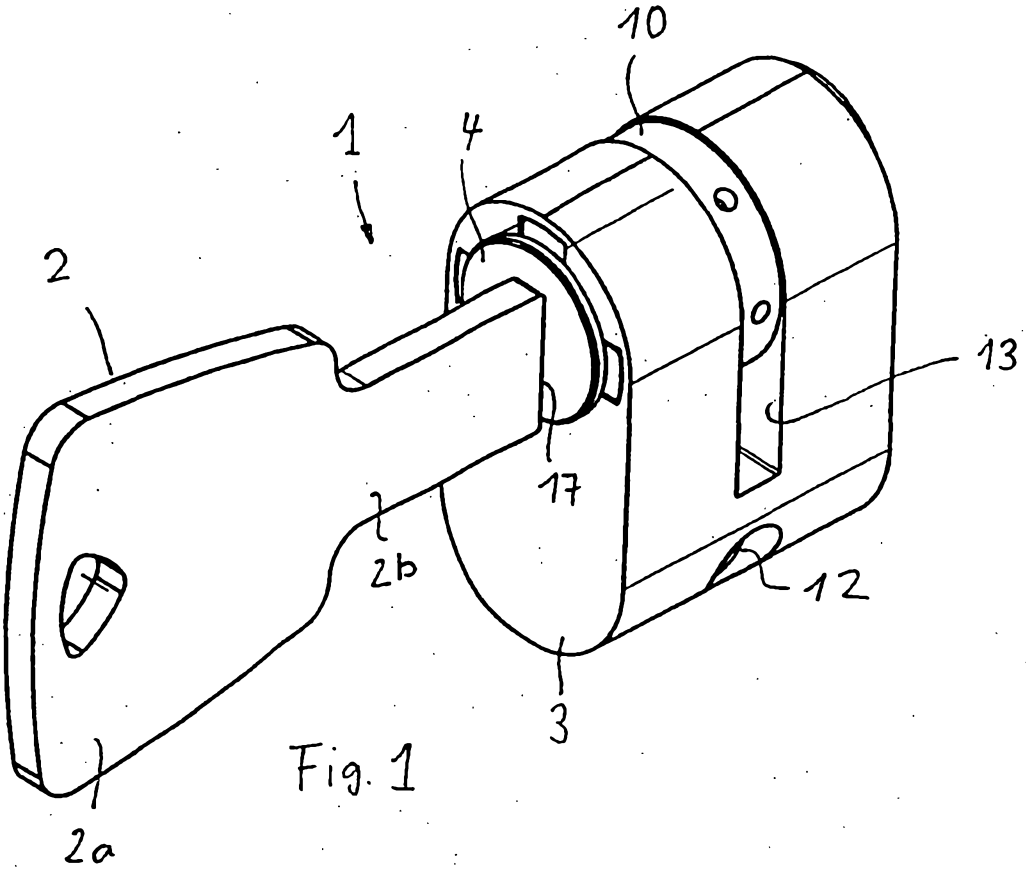


Fig. 1

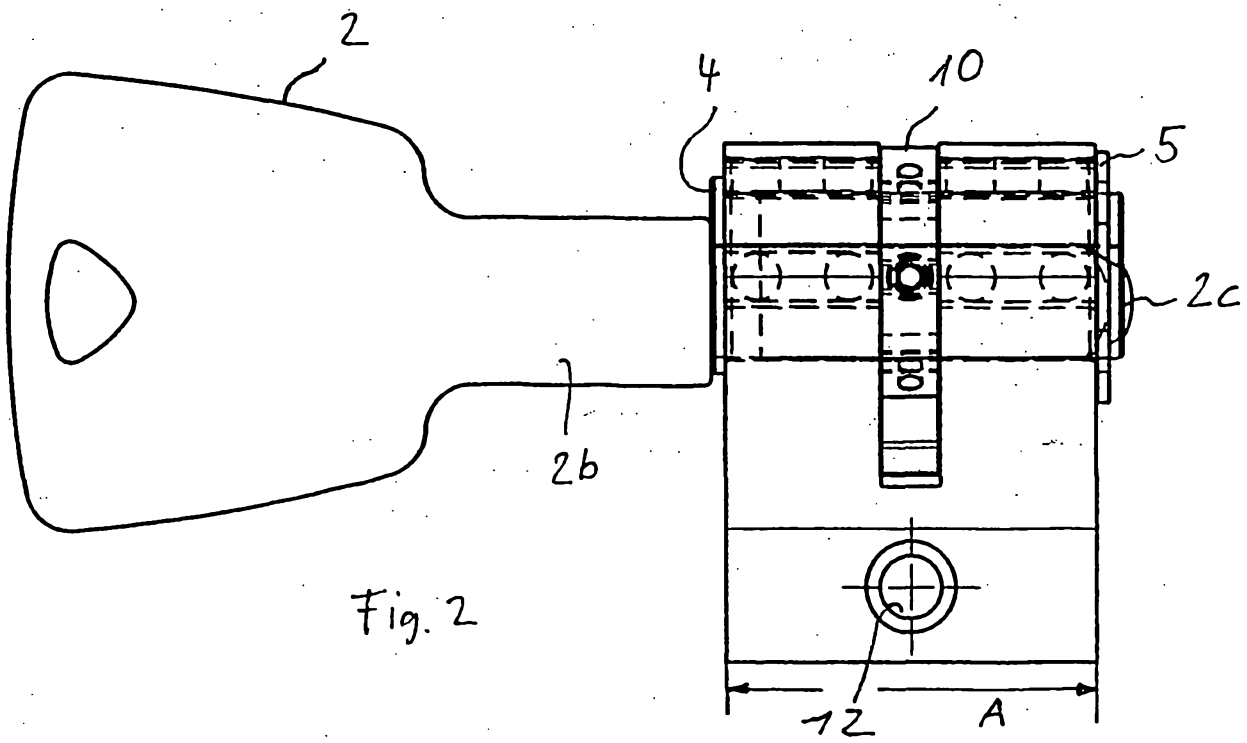


Fig. 2

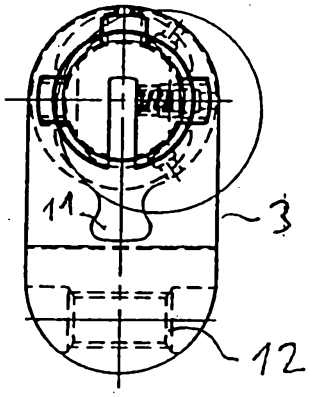


Fig. 3

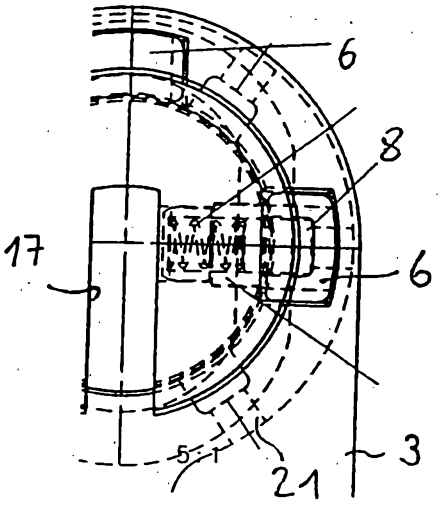


Fig. 4

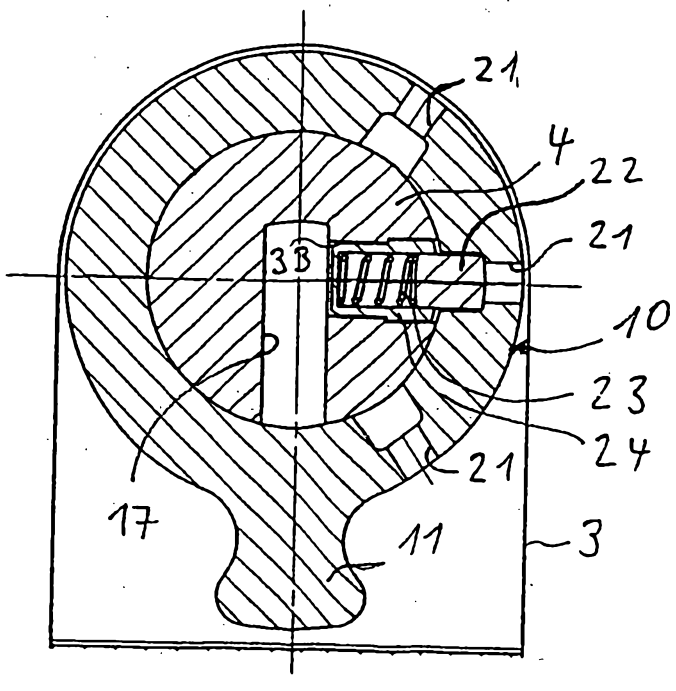


Fig. 5

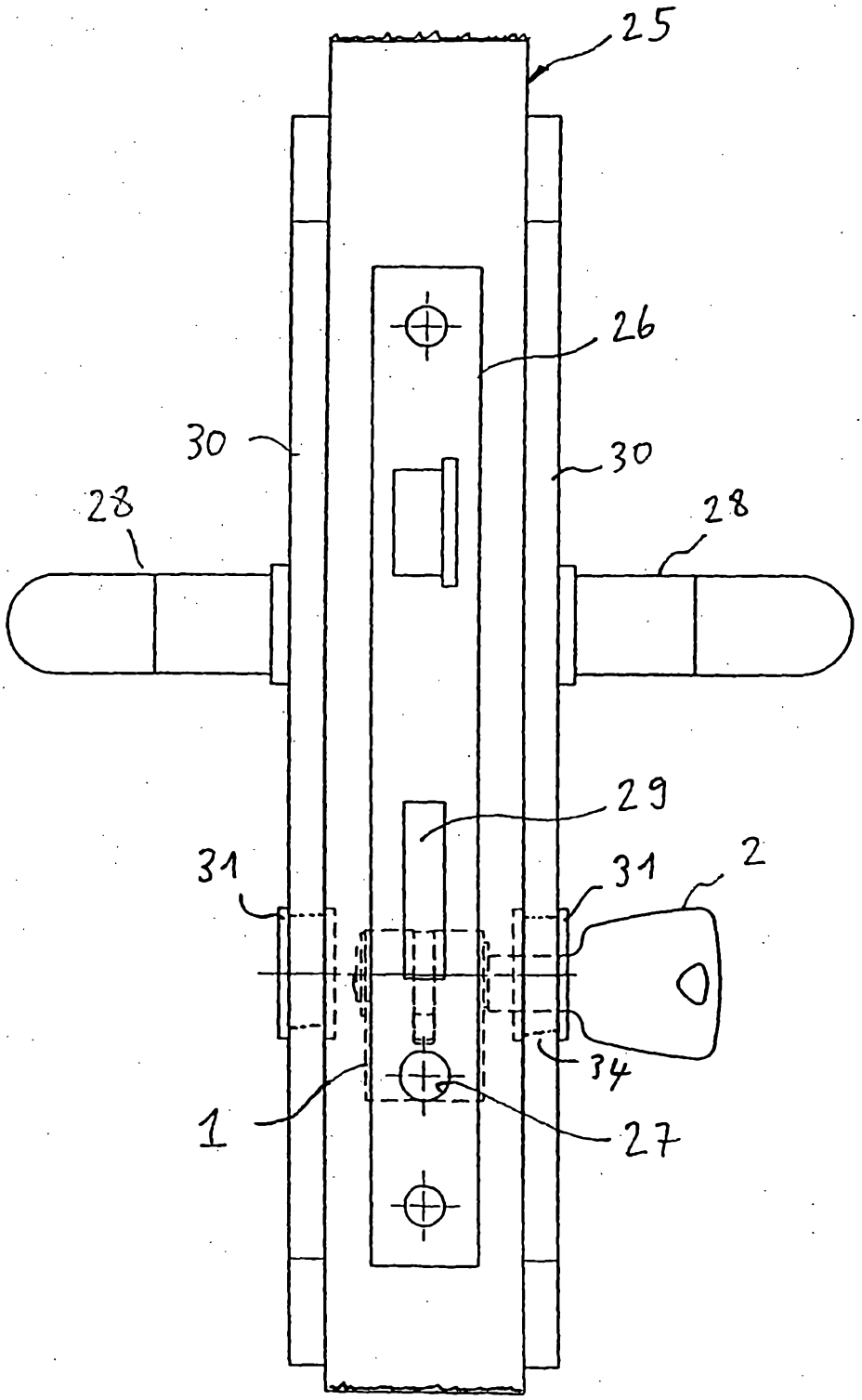


Fig. 6

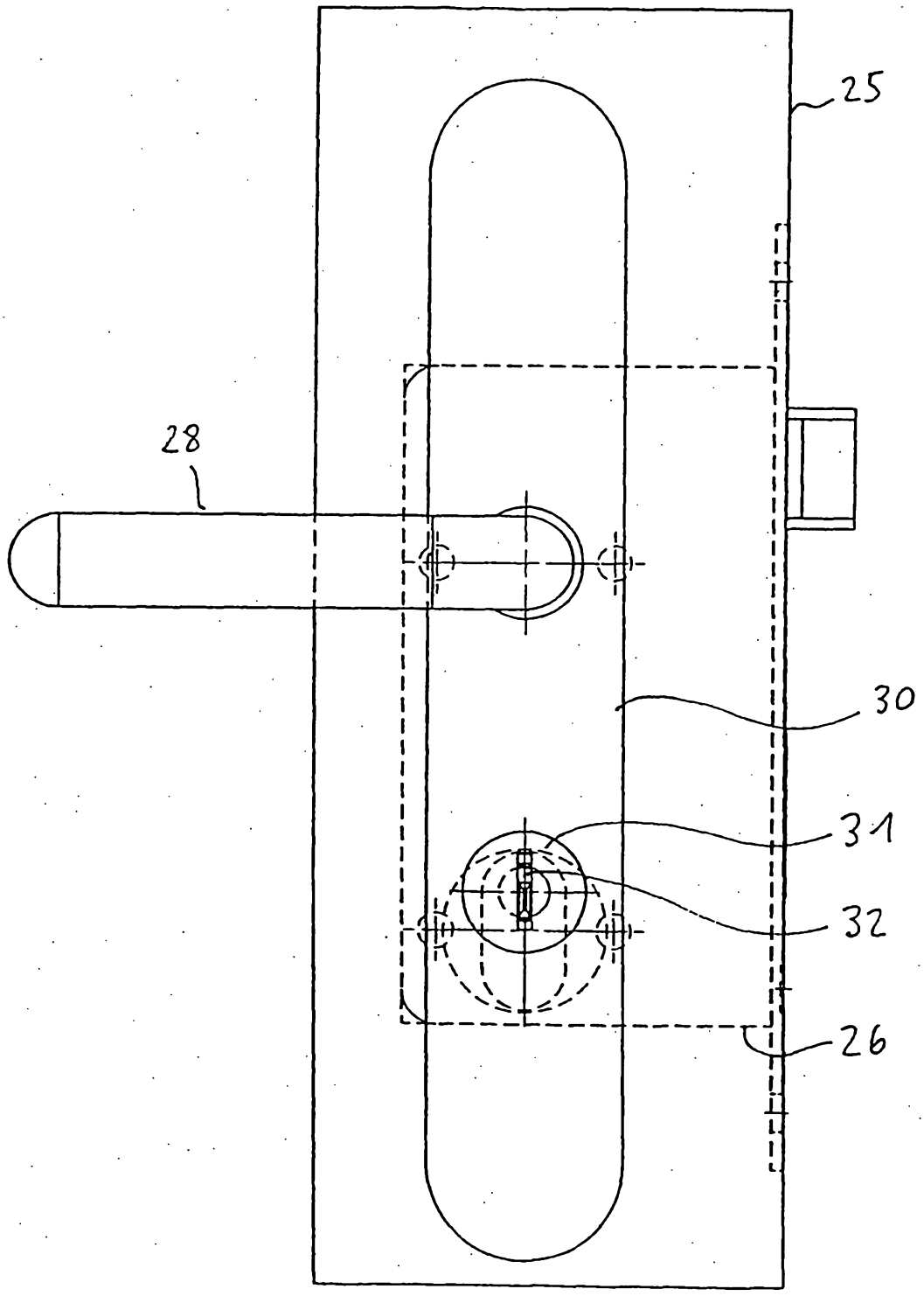


Fig. 7

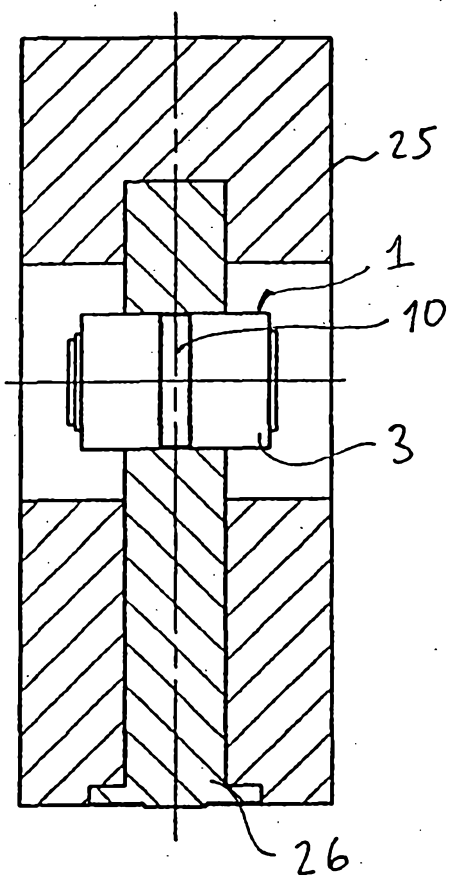


Fig. 8

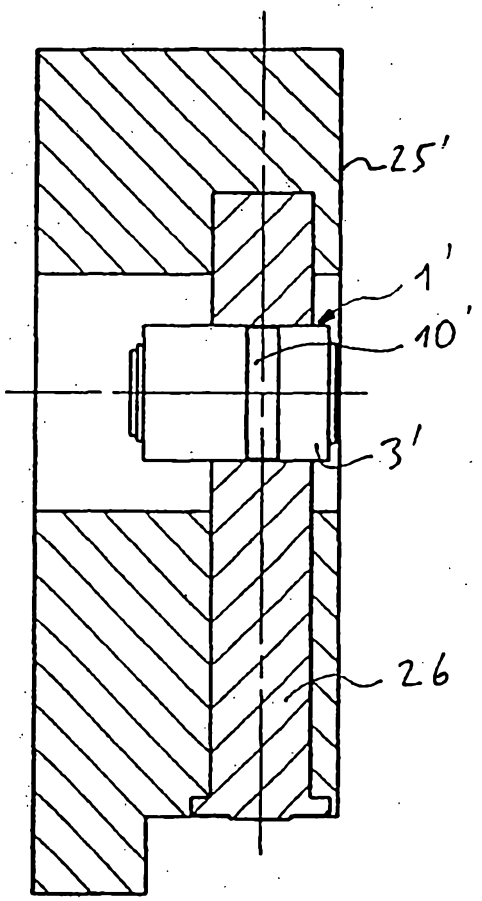


Fig. 9

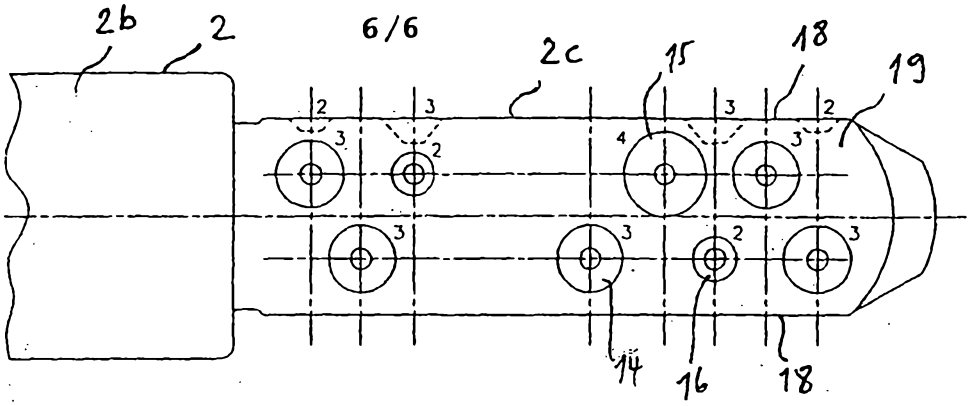


Fig. 10a

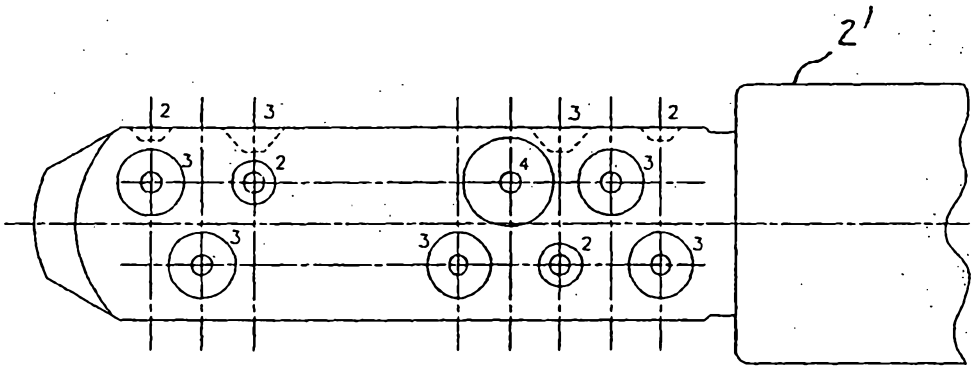


Fig. 10b

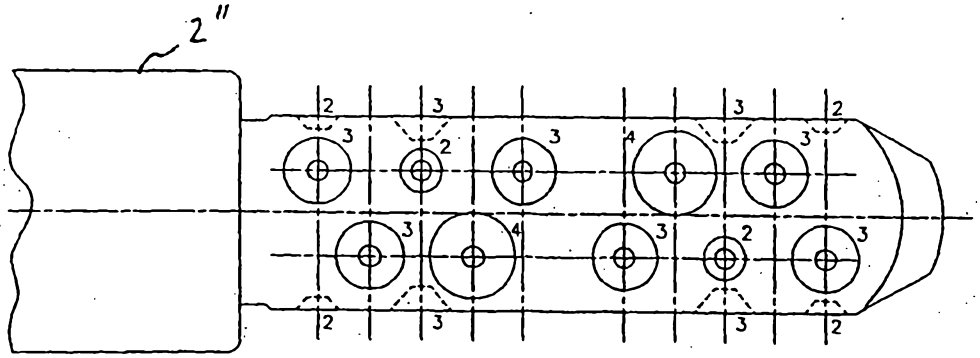


Fig. 10c

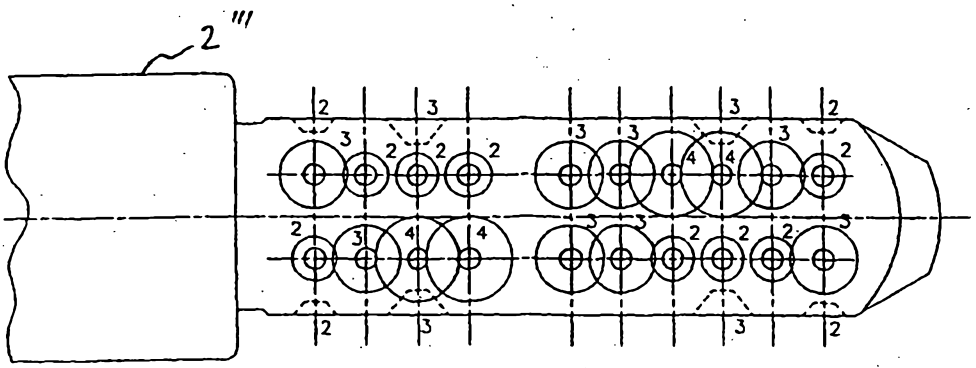


Fig. 10d