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(54) Guiding device for two parts which can move with respect to each other in opposite directions, particularly for pieces of furniture or the like

(57) A guiding device for two parts (31,32) which can move with respect to each other in opposite directions, particularly for pieces of furniture or the like, the device comprising at least one guiding profiled element (1) which supports, so that they can slide along its longitudinal extension, at least two sliding blocks (2,3) which are associable with one moving part (31) and with the other moving part (32) respectively. Each one of the two sliding blocks (2,3) is connected to a rack (4,5) which is slidingly accommodated in a longitudinal seat formed in the guiding profiled element (1). A pinion (8) is supported, so that it can rotate about its own axis, in an intermediate region of the guiding profiled element and meshes, by means of two diametrically mutually opposite regions, with the racks (4,5) connected to the sliding blocks (2,3).

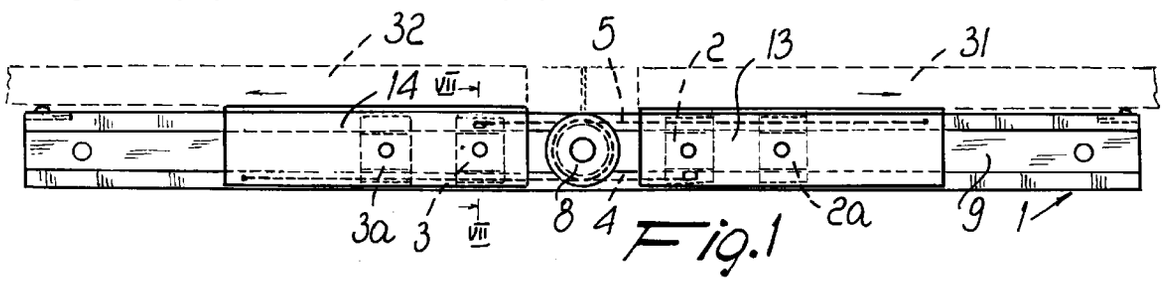


Fig. 1

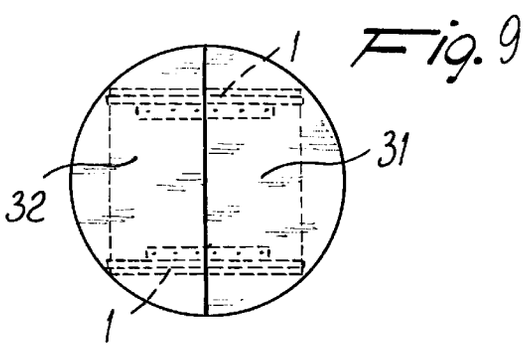


Fig. 9

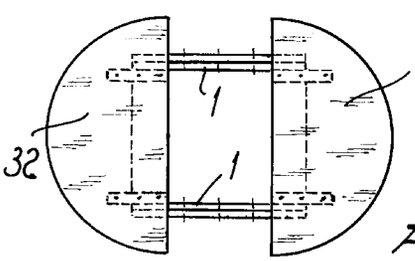


Fig. 10

EP 0 841 026 A2

Description

The present invention relates to a guiding device for two parts which can move with respect to each other in opposite directions, particularly for pieces of furniture or the like.

Guiding devices meant to allow the movement of two parts which can move with respect to each other in opposite directions are known in the field of furniture. This is the case, for example, of pull-out tables in which one table surface is divided into two portions, which can be moved mutually apart so as to allow to interpose an element for extending the table surface.

In order to allow the movement of the two moving parts of pull-out tables of this kind, devices are currently used which are substantially constituted by a profiled element meant to be fixed to the supporting structure of the table and inside which two pulleys with parallel axes are supported; a wire-like element, usually made of steel, winds around said pulleys. The wire-like element is arranged on a substantially vertical plane and is connected, by means of its upper portion, to a block which can slide along the profiled element and is connected to one of the moving parts of the table surface, while the lower portion of the wire-like element is connected to another block which is fixed to the other moving part of the surface.

As a consequence of the connection between the two blocks connected to the wire-like element, when one moving part of the surface is moved in one direction, the other moving part shifts in the opposite direction, so as to achieve the mutual spacing or approach of the two moving parts.

The two blocks are furthermore generally fixed to suitable sliding guides, which are coupled to the profiled element by means of a plurality of ball bearings to facilitate the translatory motion of the moving parts of the table surface.

These devices entail some drawbacks.

They are in fact labor-intensive to assembly, particularly as regards the wire-like element on the pulleys.

Moreover, the moving parts of the device are exposed and can therefore be touched by cloths when cleaning the piece of furniture or by other foreign objects which can get caught in the moving parts, compromising the correct functionality of the device.

These devices also have limited flexibility as regards their manufacture, particularly when size changes are required.

Labor-intensive assembly also significantly affects overall production costs.

Another drawback is the fact that the ease with which the two moving parts connected to the blocks can slide can be altered by an incorrect tension of the wire-like element.

The aim of the present invention is to obviate the above drawbacks, by providing a guiding device for two parts which can move with respect to each other in opposite directions, meant particularly for the field of furniture or the like, which can be assembled very easily and quickly, so as to have low production costs.

Within the scope of this aim, an object of the present invention is to provide a device which is highly precise in operation even after a large number of duty cycles.

Another object of the present invention is to provide a device which is highly reliable in operation.

This aim, these objects and others which will become apparent hereinafter are achieved by a guiding device for two parts which can move with respect to each other in opposite directions, particularly for pieces of furniture or the like, characterized in that it comprises at least one guiding profiled element which supports, so that they can slide along its longitudinal extension, at least two sliding blocks which are associable with one moving part and with the other moving part respectively, each one of said two sliding blocks being connected to a rack which is slidingly accommodated in a longitudinal seat formed in said guiding profiled element; a pinion being supported, so that it can rotate about its own axis, in an intermediate region of said guiding profiled element, said pinion meshing, by means of two diametrically opposite regions thereof, with the racks connected to said sliding blocks.

Further characteristics and advantages of the present invention will become apparent from the following detailed description of a guiding device according to the invention, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

figure 1 is a side elevation view of the device according to the invention, with the two sliding blocks in the maximum mutual approach position;
figure 2 is a view, similar to figure 1, of the device according to the invention, with the two sliding blocks in the maximum mutual spacing position;
figure 3 is a partially sectional exploded perspective view of the guiding profiled element, of the two racks and of a sliding block of the device according to the invention;
figure 4 is an exploded perspective view of a sliding block;
figure 5 is an exploded perspective view of a detail of a longitudinal end of the guiding profiled element;
figure 6 is a sectional view of the same detail shown in figure 5, in assembled condition;
figure 7 is an enlarged-scale sectional view of figure 1, taken along the plane VII-VII;
figure 8 is an enlarged-scale sectional view of figure 2, taken along the plane VIII-VIII;
figures 9 and 10 are views of the application of the device according to the invention to a pull-out table, shown respectively in the normal position and in the extended position.

With reference to the above figures, the device

according to the present invention comprises at least one guiding profiled element 1 which supports, so that they can slide along its longitudinal extension, at least two sliding blocks 2 and 3 which are respectively associable with one moving part 31 and with the other moving part 32 which are to be moved with respect to each other in opposite directions.

Each one of the two sliding blocks 2 and 3 is connected to a rack, designated by the reference numerals 4 and 5 respectively, and is slidingly accommodated within a longitudinal seat 6, 7 formed in the body of the guiding profiled element 1. A pinion 8 is supported, so that it can rotate about its own axis 8a, in an intermediate region of the extension of the guiding profiled element 1 and simultaneously meshes, by means of two diametrically opposite regions thereof, with the racks 4 and 5 connected to the sliding blocks 2 and 3.

More particularly, the guiding profiled element 1 has a substantially C-shaped transverse cross-section; in a central position thereof there is provided a central sliding seat 9 for the sliding blocks 2 and 3, which protrude, with a portion 10 thereof meant to be fixed to one or the other of the moving parts, from the open side of the C-shaped configuration of the guiding profiled element 1.

The longitudinal seats 6 and 7, which accommodate the racks 4 and 5, are formed in the guiding profiled element 1 laterally and on opposite sides with respect to the central sliding seat 9.

It should be noted that the guiding profiled element 1 can be constituted by an extruded profiled element, for example made of light alloy, in which both the central sliding seat 9 and the longitudinal seats 6 and 7 for the racks are provided directly during extrusion and without additional machining.

The racks 4 and 5 can be connected to the respective sliding blocks 2 and 3 by providing, on the side of the racks that is meant to be directed toward the sliding block to which the rack is to be connected, pins 4a, 5a which are engaged in seats 11 provided for this purpose inside the sliding blocks 2 and 3.

The connection of a sliding block to the corresponding moving part can be provided by means of a bracket 13, 14 which couples to the protruding part of the corresponding sliding block, by means of a coupling 10 which is preferably dovetail-shaped.

The brackets 13, 14 can be fixed to the corresponding sliding blocks 2, 3 by punching 12, as shown in particular in figure 7, thus avoiding the use of screws or of other more complex fixing elements.

The guiding profiled element 1 forms, with one of its sides, a sliding surface 15 for the moving parts that are associated with the sliding blocks 2 and 3. Low-friction balancing means, designated by the reference numeral 20, for the moving parts are arranged along said side, at least proximate to the longitudinal ends of the guiding profiled element 1.

More particularly, the low-friction balancing means comprise a wheel 21 which is partially accommodated in the guiding profiled element 1 and protrudes therefrom through a specifically provided opening 22, so as to form a region for the rolling-friction resting of the lower face of the moving part if the guiding profiled element 1 is fitted horizontally, as in the case of pull-out tables, as will become apparent hereinafter.

The wheel 21 is mounted on a clip 23, which can be inserted in the longitudinal seat 6 from a longitudinal end of the guiding profiled element 1 and can be engaged in a snap-together fashion, by means of a stud 33, in a retention abutment 24 which is constituted for example by a hole formed in the guiding profiled element 1.

Stop abutments can be provided proximate to the longitudinal ends of the guiding profiled element 1, in the central seat 9 or in the longitudinal seats 6 and 7, in order to delimit the sliding of the sliding blocks 2 and 3. Said stop abutments can be simply constituted by raised portions, such as punched areas, or by screws or other abutments to be associated with the guiding profiled element 1.

Preferably, each moving part 31, 32 can be connected to one or more sliding blocks associated with a same rack. In the illustrated embodiment, in addition to the sliding blocks 2 and 3 there are also provided two other sliding blocks, designated by the reference numerals 2a and 3a respectively, which are connected to one moving part 31 and to the other moving part 32 respectively.

For the sake of completeness in description, it should be noted that the region of the guiding profiled element 1 that accommodates the pinion 8 can be covered by means of a protective plug 30.

The use of the device according to the present invention in pull-out tables is as follows.

Two devices such as the one described above are arranged horizontally, parallel to each other, and are fixed to the supporting structure of the table. The two moving parts 31, 32 of the surface of the table are fixed to the bracket 13 of the sliding blocks 2, 2a and to the bracket 14 of the sliding blocks 3, 3a respectively.

As a consequence of the connection between the two racks 4 and 5 provided by means of the pinion 8, by acting on one of the two moving parts the mutual approach or spacing of the other moving part is achieved.

It should be noted that the device according to the present invention, despite being conceived particularly to be used in the production of pull-out tables, can in any case be used to allow mutual movement between two moving parts of pieces of furniture in general, or can in any case be used more generally also to produce safety gates, doors of elevators or for other similar uses which require the possibility to move one moving part toward or away from another moving part.

In practice, it has been observed that the device according to the present invention fully achieves the

intended aim and objects, since it is composed of a limited number of elements which can be assembled very simply and quickly, thus reducing overall manufacturing costs.

Another advantage of the device according to the present invention is that it ensures perfectly smooth sliding of the two moving parts, if they are arranged horizontally, as in the case of pull-out tables, even if the weight is considerable, by virtue of the resting with rolling friction ensured by the balancing means proximate to the longitudinal ends of the guiding profiled elements.

In practice, the materials employed, as well as the dimensions, may be any according to requirements and to the state of the art.

Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A guiding device for two parts which can move with respect to each other in opposite directions, particularly for pieces of furniture or the like, characterized in that it comprises at least one guiding profiled element which supports, so that they can slide along its longitudinal extension, at least two sliding blocks which are associable with one moving part and with the other moving part respectively, each one of said two sliding blocks being connected to a rack which is slidingly accommodated in a longitudinal seat formed in said guiding profiled element; a pinion being supported, so that it can rotate about its own axis, in an intermediate region of said guiding profiled element, said pinion meshing, by means of two diametrically opposite regions thereof, with the racks connected to said sliding blocks.

2. A device according to claim 1, characterized in that said guiding profiled element has a substantially C-shaped transverse cross-section and is centrally provided with a central sliding seat for said sliding blocks, which protrude, with a portion thereof to be fixed to one or the other of the moving parts, from the open side of the C-shaped cross-section of said guiding profiled element.

3. A device according to claim 2, characterized in that the longitudinal seats that accommodate said racks are formed in said guiding profiled element laterally, on mutually opposite sides with respect to said central sliding seat.

4. A device according to claim 1, characterized in that said guiding profiled element forms, with one of its sides, a sliding surface for said moving parts, low-friction balancing means for said moving parts being arranged along said side, at least proximate to longitudinal ends of said guiding profiled element.

5. A device according to claim 4, characterized in that said low-friction balancing means comprise a wheel which is partially accommodated in said guiding profiled element and protrudes therefrom through an opening formed in said sliding surface.

6. A device according to claim 5, characterized in that said wheel is supported by a clip which can be inserted in one of said sliding seats through one of the longitudinal ends of said guiding profiled element and can be coupled in a snap-together fashion with a retention abutment provided in said guiding profiled element.

7. A device according to claim 1, characterized in that it comprises stop abutments which limit the sliding of said sliding blocks along said guiding profiled element.

8. A device according to claim 1, characterized in that said sliding blocks are connected to one moving part and to the other moving part, respectively, by means of a bracket which is connected to the corresponding sliding block by means of a dovetail-shaped coupling.

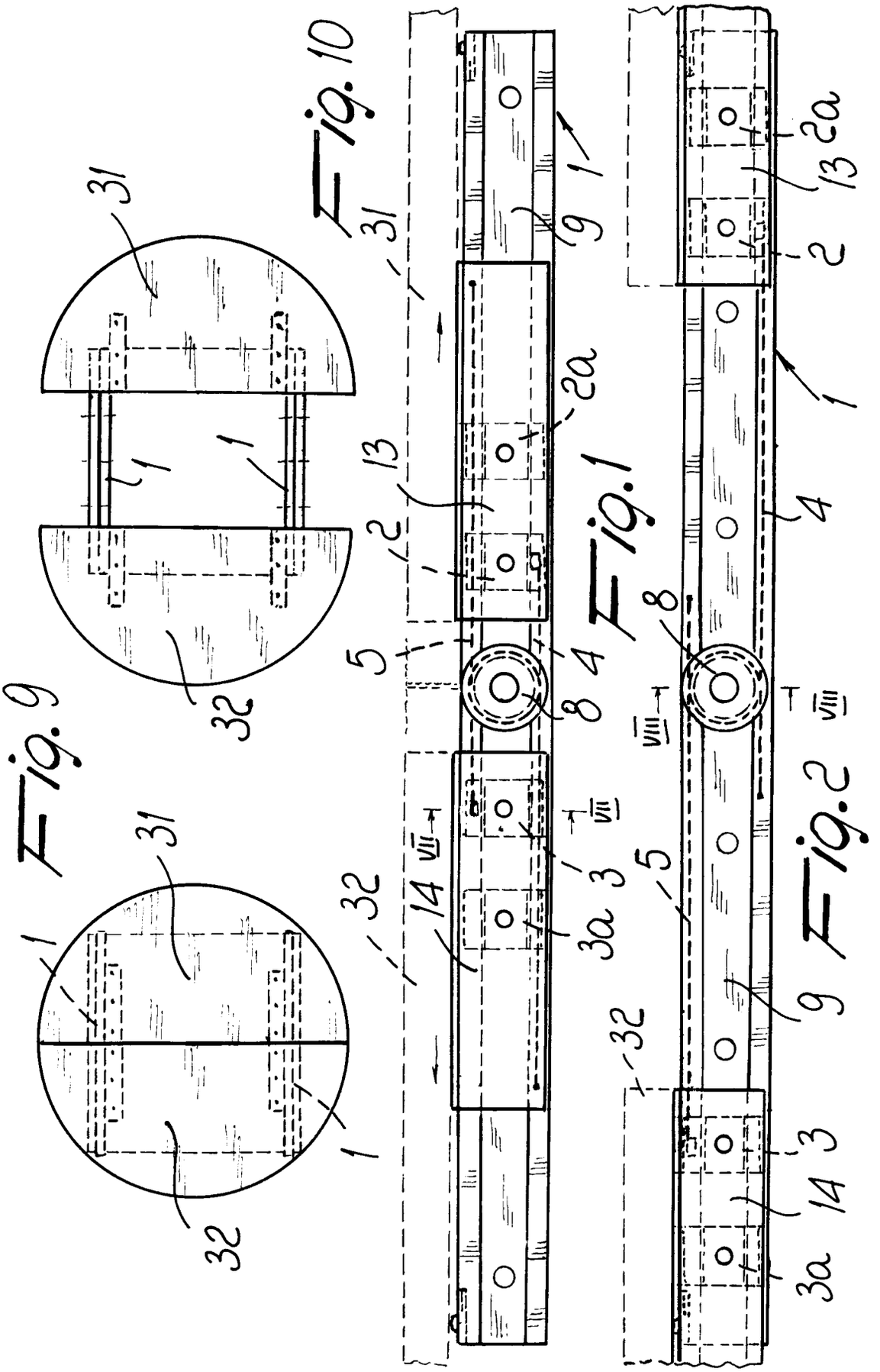
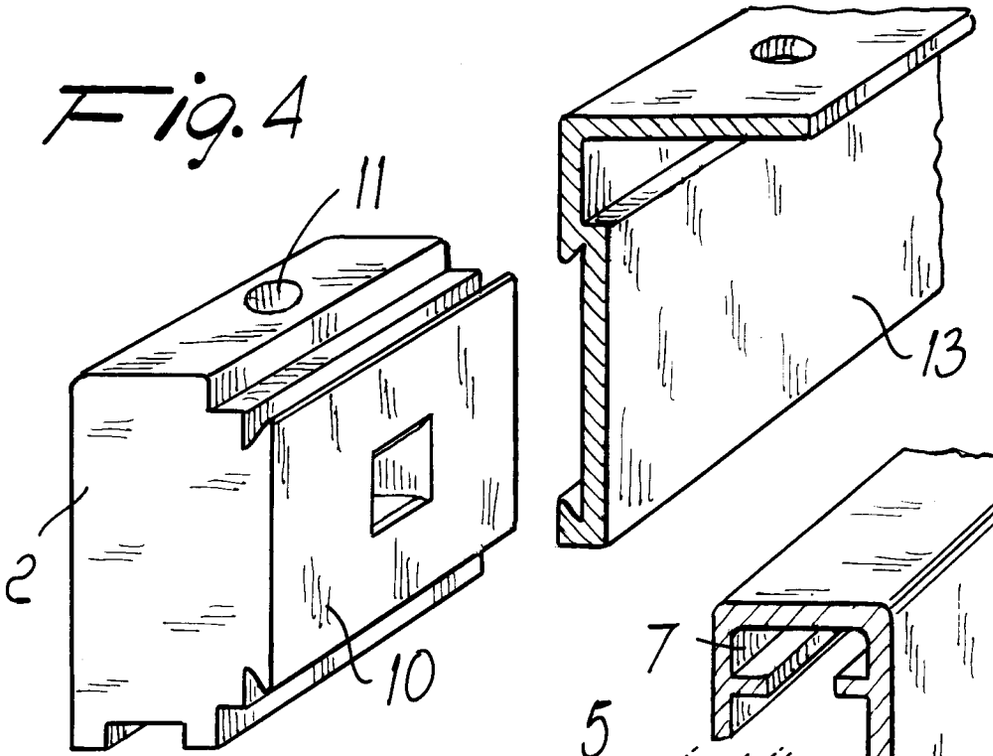


Fig. 9
Fig. 10
Fig. 1
Fig. 2
31
32
1
2
2a
3
3a
4
5
8
9
13
14
VIII

Fig. 4



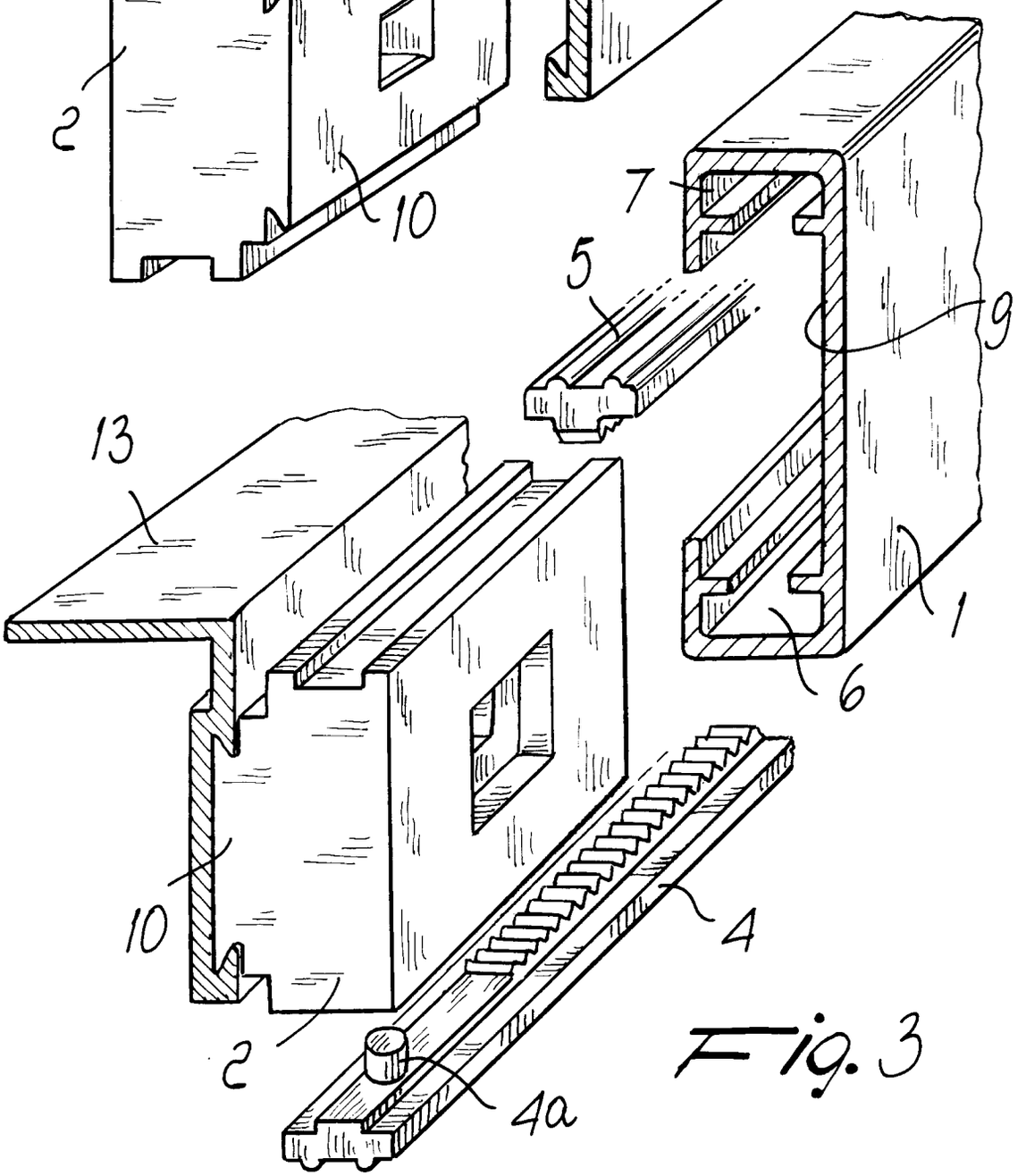


Fig. 3

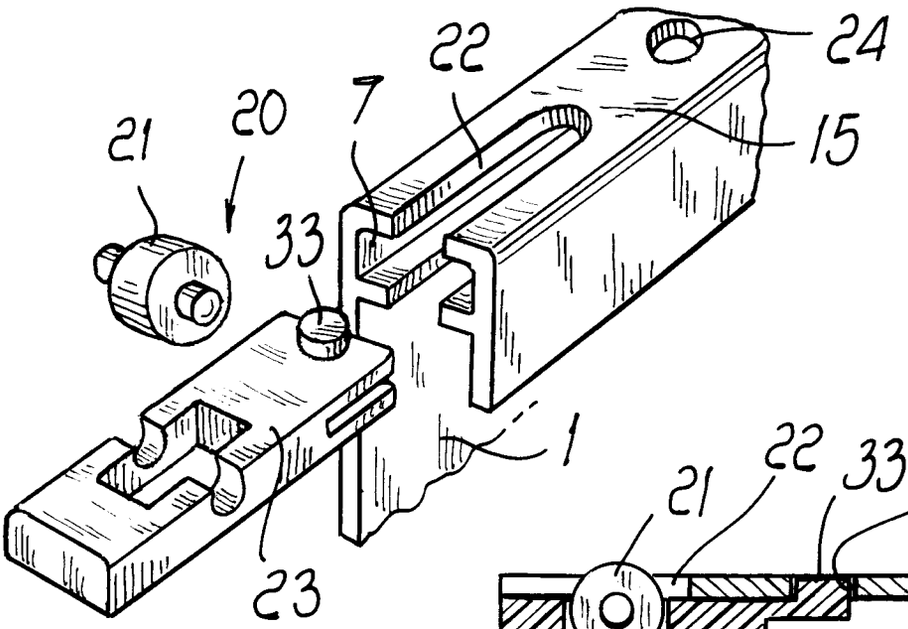


Fig. 5

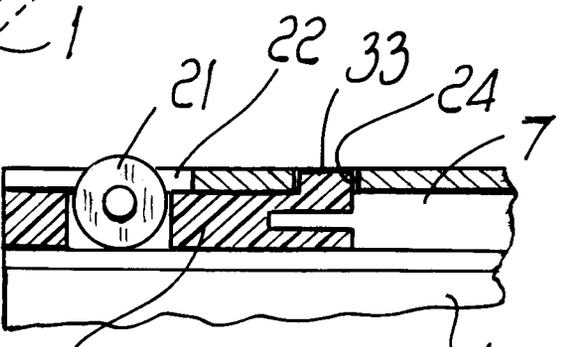


Fig. 6

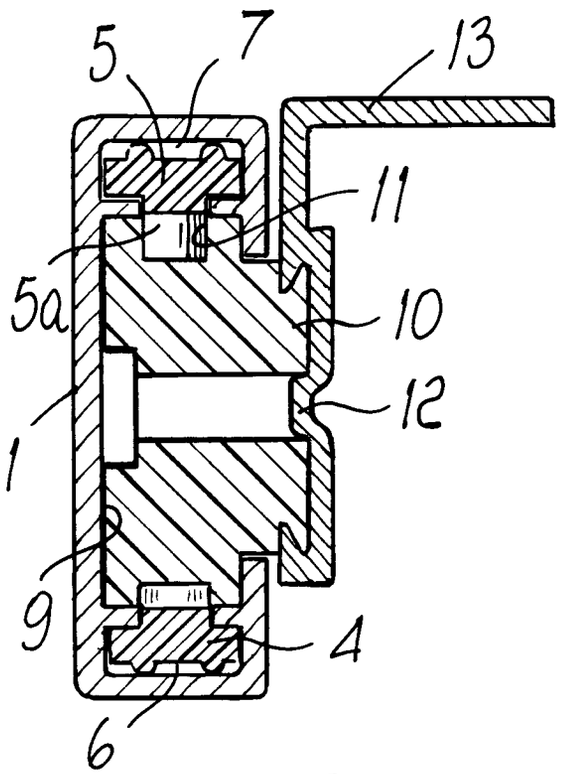


Fig. 7

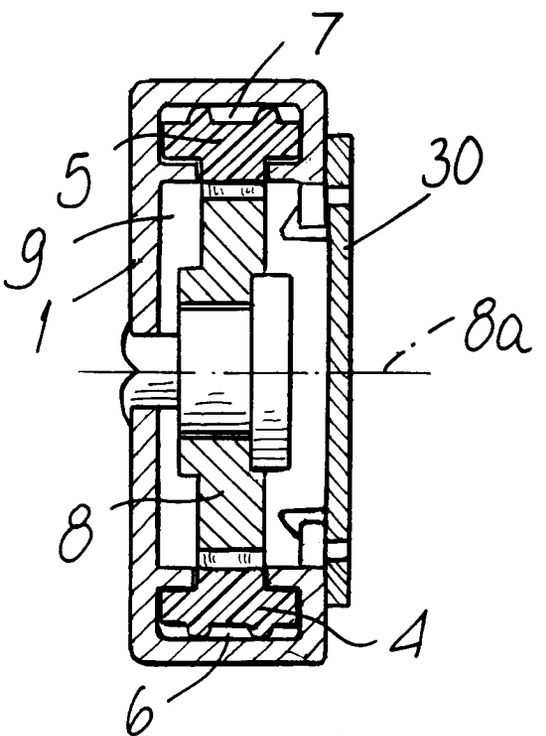


Fig. 8