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(54) Guide and actuator assembly for gates.

(57) The assembly includes a plurality of parallel bars (3) which are connected to one another by diagonal elements which are articulated in the shape of a parallelogram; the sliding guides (4) of the bars (3) are vertical, and the ends of the bars of the gate are guided into the openings of the guides; respective threaded stems are rotatably mounted inside the guides (14), respective female threads (15) engaging along the stems, the female threads (15) being rigidly associated with the last bar.

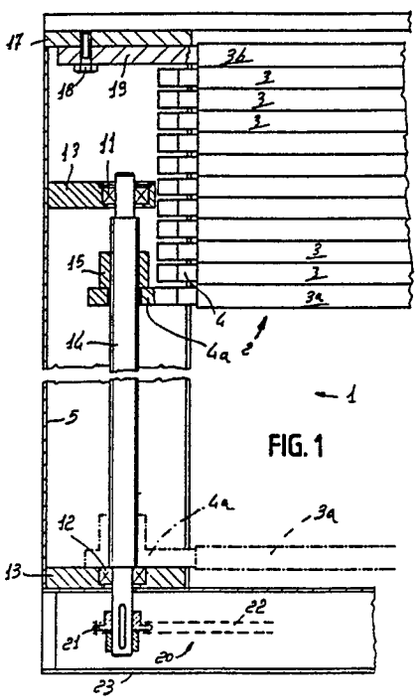

FIG. 1

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GUIDE AND ACTUATOR ASSEMBLY FOR GATES

The present invention relates to a guide and actuator assembly for gates.

Gates are known which are constituted by vertical bars connected to one another by diagonal elements articulated in the shape of a parallelogram: the gate is arranged between an upper sliding guide and a lower sliding guide, and, when opened, it is packed at one side of the opening in which it is mounted.

Horizontally sliding gates of this type have the disadvantage of reducing the width of the gap, window or door in which they are mounted and they are furthermore easily attacked at the sliding couplings with the guides; said guides are in fact usually constituted by profiled elements with a U-shaped cross section, inside which the upper and lower ends of the bars simply slide, and it is easy to force said guides and twist off the ends of said bars.

The opening and closure of these gates is furthermore extremely inconvenient and requires some physical strain, so that the user often does not close the gate during short absences and ill-intentioned people often take advantage of these distractions.

The technical aim of the present invention is to obviate the above described disadvantages by providing a guide and actuator assembly for gates by means of which doors and windows are closed in an extremely solid and secure manner and which can be actuated in an extremely rapid manner and without physical strain.

Within the scope of this technical aim, an object of the present invention is to achieve the above described aim with a simple structure which is relatively easy to execute in practice, safe in use and effective in operation as well as relatively modest in cost.

This aim and this object are acheived by a guide and actuator assembly for gates comprising a plurality of parallel bars which are connected to one another by diagonal elements which are articulated in the shape of a parallelogram, characterized in that it comprises slide vertical guides for said bars, the ends of said bars of said gate being guided into openings provided at said guides, a respective threaded stem being rotatably mounted inside each of said guides, a respective female thread being engaged along said stem, said female thread being rigidly associated with a last bar of said bars, said stems being associated with kinematic coupling means which are rotably actuated by a motor unit.

Further characteristics will become apparent from the detailed description of a preferred but not exclusive embodiment of a guide and actuator assembly according to the invention, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

figure 1 is a partially sectional side view of a guide and actuator assembly for gates according to the invention;

figure 2 is an enlarged top view of a detail of said assembly;

figure 3 is a top view of a detail of an assembly according to a further aspect of the invention.

With reference to the figures, the numeral 1 generally indicates the guide and actuator assembly for a gate 2 according to the invention.

The gate 2 is of the type constituted by a plurality of parallel bars 3 which are connected to one another by diagonal elements (not illustrated) articulated in the shape of a parallelogram.

At their two ends, each of the bars 3 has respective guide skids 4 which have a T-shaped plan cross section.

Two vertical slide guides 5 are provided at each side of the gate, of which just the left one is visible in the figure. Each vertical guide 5 comprises profiled elements 6a, 6b, joined by L-shaped elements 6c to define a substantially C-shaped cross section having an opening facing the opening of the opposite vertical guide; the skids 4 are loosely fitted to slide in the openings of the guides 5.

Profiled elements 6 are fixed by means of screws 7 to the wall all around the gap, window or door to be closed, and, optionally, a shaped profiled element 8, defining a vertical channel 9 for a blind (not illustrated), may be rigidly associated with said profiled elements 6; an outer wooden frame 10 can be fixed to said shaped profiled element 8, and the window or door is provided with the conventional frame for the glass pane toward the inside of the room.

A threaded stem 14 is rotatably mounted inside each of said guides 5 by means of upper bearings 11 and lower bearings 12 which are supported by respective ledges 13 fastened with screws inside the profiled elements.

A female thread 15 is threaded onto the stem 14 and is welded to an extension 4a of the skid of the last bar 3a (for example the lower one) of the gate, whereas the first bar 3b of the gate is fixed to the upper beam 17 by means of a bolt which blocks a lateral extension 19 of the bar.

The bearing 11 is supported by a ledge 13 which is arranged at a distance from upper beam 17 approximately corresponding to the thickness of

the packed bars 3, when the gate is open.

The threaded stem 14 is connected to a similar threaded stem 14 of the other side of the window (not illustrated) by kinematic coupling means 20 which, in the case illustrated in the figure, are constituted by toothed sprockets 21 keyed to the lower ends of the stems 14 and connected in pairs by chains 22.

Said means 20 are contained inside the lower beam 25 of the window frame and are preferably actuated by means of an electric motor-reducer unit or manually with a crank.

According to a further aspect of the invention, not illustrated in the drawings, the kinematic coupling means 20 are constituted by bevel gears which connect the threaded stems to a horizontal shaft contained in the lower beam 23.

Still in a further aspect of the invention, illustrated in figure 3, the fact is exploited that the bars 3 of the gate 2 are usually constituted by two profiled elements 3c, 3d which are spaced with U-shaped cross sections, the openings whereof are opposite; parallelogram-shaped diagonal elements are mounted therebetween.

In this case, the guides 5, instead of having a C-shaped cross section with slightly closed openings, as in the assembly described above, have a U-shaped open cross section 26, and an upright 27 is fixed at the opening above and below; said upright is optionally made of two parts assembled by means of screws 28 with a T-shaped cross section which has a wing inserted in the space between the profiled elements 3a and 3b and makes it difficult to force the bars out of the guides.

The female thread 15 is defined in a small block 29 which is rigidly associated with two parallel arms 30 which are fixed by welding, riveting or the like to the profiled elements 3a and 3b.

This embodiment allows to avoid the machinings required to fix the skids to the bars and reduces the weight of the movable parts (there is no longer the skids' weight).

In a further embodiment, the upright is eliminated and the threaded stem is mounted between the profiled elements 3a and 3b which, if required, are perforated along vertical axes to allow the loose passage of the threaded stem.

In order to avoid undue stresses to the motor, opening and closure end stop switches or even mechanical stops constituted by unthreaded terminal regions of the stems (with lower stroke limit springs for the re-engagement of the female threads), or clutches or motor-overload releases are provided.

The operation of the assembly according to the invention is apparent: by rotating the threaded stems in one direction or the other, the female threads lower or rise and simultaneously move the terminal bar so that it remains horizontal: said bar progressively moves the others from a lowered condition, by which the gap, window or door is closed to a raised opening position with the bars packed at the top: the coupling of the skids to the guides is not easily attacked since a sort of forcing-proof engagement is configured between the T of the skid and the C of the guide.

It is furthermore difficult to lift the lower bar, which is coupled to the threaded stems at its ends.

It should be noted that the bulk of the guides, uprights and beams is extremely small and that the actuation of the assembly is very rapid and easy.

Naturally the lower bar can be equipped with a key-lock, for locking it to the lower beam, and the motor switch may be activated by a security key.

It has thus been observed that the invention achieves the proposed aim and objects.

The invention thus conceived is susceptible to numerous modifications and variations, all of which are within the scope of the inventive concept.

All the details are furthermore replaceable with other technically equivalent elements.

In practice, the materials employed, as well as the shapes and dimensions, may be any according to the requirements without thereby abandoning the scope of the protection of the appended claims.

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 scope of each element identified by way of example by such reference signs.

Claims

1. Guide and actuator assembly for gates comprising a plurality of parallel bars (3) which are connected to one another by diagonal elements which are articulated in the shape of a parallelogram, characterized in that it comprises slide vertical guides (5,26) for said bars, the ends of said bars of said gate (2) being guided into openings provided at said guides, a respective threaded stem (14) being rotatably mounted inside each of said guides, a respective female thread (15) being engaged along said stem, said female thread being rigidly associated with a last bar (3a) of said bars, said stems being associated with kinematic coupling means (20,22) which are rotatably actuated by a motor unit.

2. Assembly according to claim 1, characterized in that a first bar (3b) of said bars is rigidly associated with a fixed frame (17) of said gate (2).

3. Assembly according to claim 1, characterized in that said kinematic coupling means (20) comprises sprockets (21), each of said sprocket being keyed to one end of each of said stems (14), said sprockets being connected to one another in pairs by a chain (22).

4. Assembly according to claim 1, characterized in that said kinematic coupling means (20) comprises a shaft which is co-planar and orthogonal to said threaded stems and is connected to said stems by means of bevel gears.

5. Assembly according to claim 1, characterized in that each of said parallel bars (3) have, at each end thereof, a skid (4) with a substantially T-shaped cross section, said skid being guided in said opening of said guide which have a substantially C-shaped cross section.

6. Assembly according to claim 1, characterized in that each of said parallel bars (3) comprises two opposite spaced profiled elements (3c,3d) having a substantially C-shaped cross sections, and in that uprights (27) provided with a T-shaped wing inserted between the profiled elements of said guides (26) are fixed in openings of said guides (26), said guides having a U-shaped cross section.

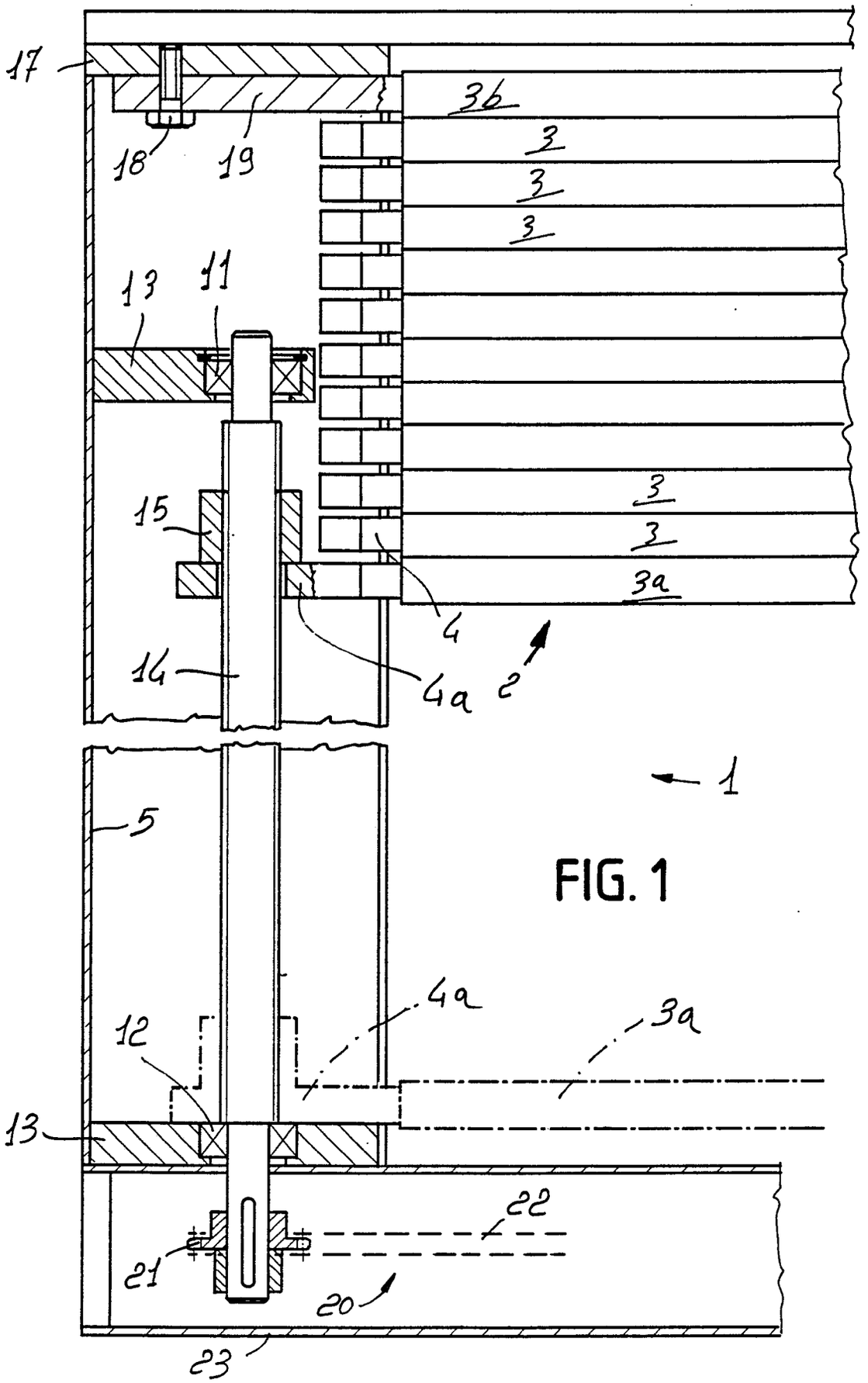

FIG. 1

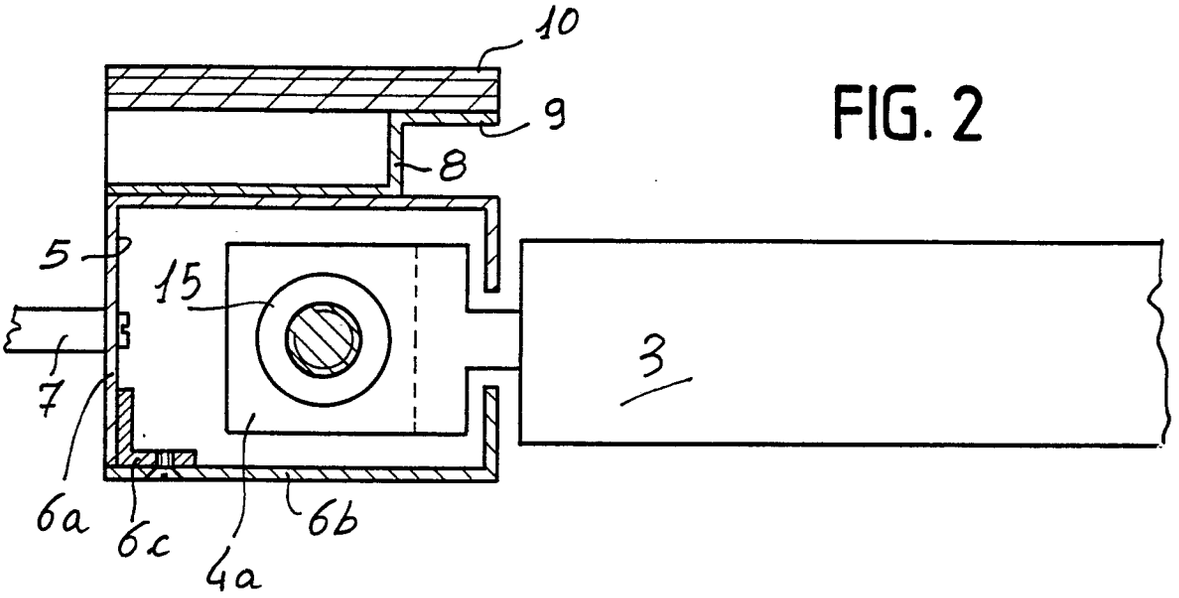

FIG. 2

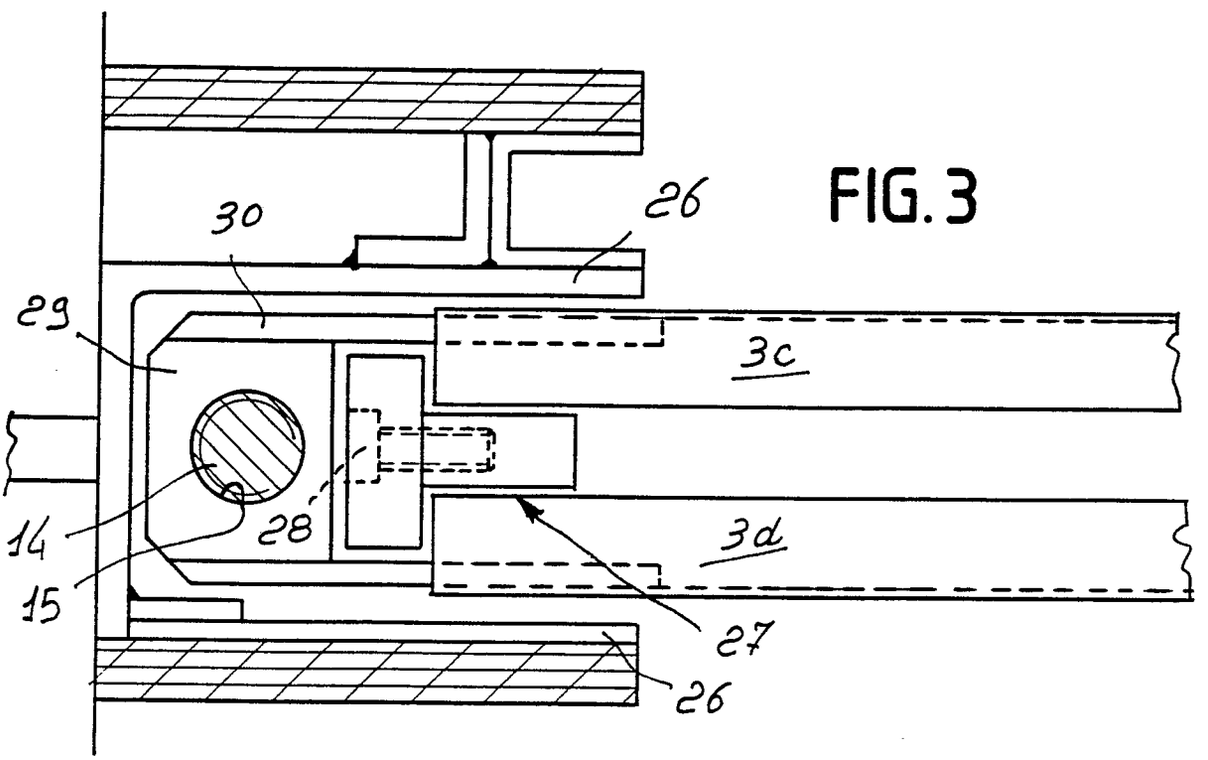

FIG. 3

European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 89 12 0591

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X	US-A-1 650 134 (KINYNER) * Page 3, lines 8-35,47-62; figure 3 *	1-4	E 06 B 9/06
A	---	5	
X	FR-A-2 566 453 (FICHET-BAUCHE) * Page 5; figure 1 *	1-4	
Y	---	5	
Y	DE-C- 247 377 (TELL) * Whole document *	5	

A	FR-A-2 557 187 (FICHET-BAUCHE) * Whole document *	6	

TECHNICAL FIELDS SEARCHED (Int. Cl.5)
E 06 B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	05-02-1990	KUKIDIS S.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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