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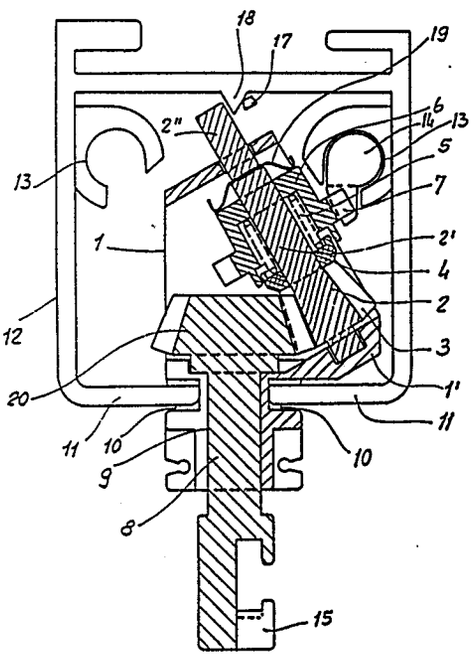
(54) A track mechanism for the orientation and displacement of the strips of a vertical strip blind.

(57) The mechanism in question comprises a first spindle (2) supported by a prismatic box-like body (1), and at one end thereof it receives a toothed wheel. Fitted to the spindle (2) with the interposition of resilient biasing means, is a hollow cylindrical element (6) having a circumferential ring of projecting teeth (7). The toothed wheel (3) of the spindle (2) engages a cooperating toothed wheel (20) carried at the end of a second spindle (8) which is also formed with a support hook for one of the strips (16) of a vertical strip blind. The body (1) is housed, with the spindle (2) disposed on one side thereof, in a sliding track provided with opposed guides for the passage of a flexible control member, this latter being engageable with the toothed circumferential projection (7) formed on the hollow cylindrical element which surrounds the first spindle (1).



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"A track mechanism, for the orientation and displacement of the strips of a vertical strip blind"

The present invention relates to a track mechanism, for the orientation and displacement of the strips of a vertical strip blind. As is known, currently, vertical strip blinds are largely utilised for the covering and decoration of windows in general, such blinds being constituted by adjacent strips of suitably reinforced fabric. Such strips are suspended from conveniently formed members slidable along a hollow track support and able to cause coordinated orientation of the strips themselves by making them turn through a given angle about their vertical axes which are all parallel to one another.

It is likewise known that the movement of such blinds can be obtained by means ofa single control or a double control; in the latter case a first cord effects the displacement of the strips (drawing together or apart) and a second cord causes rotation thereof. In the former case a single control cord (or the like) is used to perform the said two operations in sequence.

However, assemblies which are commercially available at present for obtaining, with a single control, the displacement and orientation of the strips, have a significant structural complexity and are therefore of rather high cost. This structural complexity, moreover, can detrimentally affect, at least in general, the correct operation of the

product, or at least require frequent adjustments and/or replacement of parts.

Likewise, the conventional type of displacement and orientation members for the strips usually have a not insignificant linear bulk, which only allows them to be used on rectilinear sections.

Moreover, with the currently available displacement members, whenever it is desired to provide a blind with a central aperture, it is necessary to use a double track for the sliding of the slide guides or displacement members.

The object of the present invention is to eliminate the previously described disadvantages by providing a mechanical device for the manipulation of vertical strip blinds which will be structurally simple and therefore of low cost.

Within the scope of the above mentioned object, a particular object of the present invention is to provide a mechanical device for operating vertical strip blinds; which has a substantially limited bulk in such a way as to be used even on curved profiles.

Another object of the present invention is to provide a mechanical device for operating vertical strip blinds which will allow blinds having a central opening to be formed using only a single sliding track of suitable shape.

Another object of the present invention is to provide a mechanical device for operating vertical strip blinds which is made from a limited number of component parts cooperating together in such a way as to provide an extremely secure and reliable product for the user.

The said object, as well as the above indicated objects and others, which will appear more clearly below, are achieved by a mechanism for the operation of a vertical strip blind, according to the invention, characterised by the fact that it comprises a first spindle supported by a prismatic box-like body of suitable shape, at one end of which is formed a toothed wheel and on which is fitted, with the interposition of resilient biasing means, a hollow cylindrical element provided with a circumferential projection having suitable teeth. The toothed wheel of the said first spindle engages a shaped end of a second spindle having a vertical axis, which shaped end has teeth over a part of its periphery. The second spindle carries a suitably shaped hook for supporting one of the strips of the vertical strip blind. The said prismatic box-shape body is housed with the first spindle disposed on one side or the other in a sliding track having mirror image symmetry across the vertical plane passing through its longitudinal axis and is provided with opposed guides for the passage of a flexible control member which is able to engage the circumferential toothed projection formed on the hollow cylindrical element which surrounds the first spindle.

Preferably the said first spindle is disposed obliquely

with respect to the second spindle; in this case, obviously, the corresponding toothed and partially toothed wheels formed at their facing ends and mutually engaging one another are of conical type, namely bevel wheels.

Further characteristics and advantages of the mechanism for operating vertical strip blinds, which constitutes the subject of the present invention, will be better understood with the aid of the following description of a preferred embodiment of the device itself, illustrated purely by way of non limitative example, the various figures of the attached drawings, in which:

Figure 1 is a vertical section illustrating the device fitted in an associated sliding track;

Figure 2 schematically illustrates in perspective a vertical strip blind the support and sliding track of which is equipped with a plurality of such devices;

Figure 3 is a cross-section similar to Figure 1 illustrating a second embodiment in which a first and second spindle are parallel to one another; and

Figure 4 is a view from above of the second spindle.

With particular reference to the reference numerals of the various figures in the attached drawings, the operating mechanism for a vertical strip blind in question comprises a suitably shaped prismatic box-like body 1 having an almost trapezoidal shape, with a projecting portion 1' in which are formed mountings for housing and supporting a spindle 2 disposed

with its axis preferably inclined or else vertical.

At its base portion the spindle is formed with a perimetral toothed wheel 3 similar to a toothed ring, above which is located a fixed collar 4. Upwardly from the toothed wheel 2 the spindle has a first cylindrical portion 2' and above this a second cylindrical portion 2'' of smaller diameter.

On the first cylindrical portion there is fitted, with the interposition of resilient biasing means 5, a hollow cylindrical element 6 carrying a coaxial ring 7 the perimeter of which is formed with a set of teeth in the form of a ring gear.

In particular, the said resilient biasing means can be constituted by a coil spring or by a length of rubber tube, or by other functionally equivalent members suitably dimensionsed and placed in compression by the pressing action of a resilient washer 19 for the purpose of acting as a friction clutch between the hollow cylindrical element 6 and the collar 4.

The lower toothed ring 3 of the spindle 2 is engaged by the upper end 20 of a second spindle 8 which has a mushroom head and teeth around part of its periphery. This latter is housed in such a manner that it can turn in a suitable seat 9 formed in the base of the box-like body 1 adjacent its projecting portion 1'.

The portion of the box-like body 1 constituting the said seat 9 further defines outer guides 10 for retaining and sliding along the flanges 11 of a

C-shape section 12.

This section, having a vertical plane of symmetry, has, in particular, at the inner faces of the two lateral walls respective open channels 13 of suitable section which can house a slidable member 14 which acts to cause rotation of or to draw along (in one of two directions) the toothed ring 7.

The said slidable member can be constituted, as required or preferred, by a cord or by a chain carrying balls or other suitable projecting elements, or by a perforated band or the like able to engage the teeth of the toothed ring. In particular, it is envisaged that the projecting members of the said slidable operating member should extend from the channels 13.

The toothed ring 7 the rotation of which is essentially resisted by the action of the resilient means 5, starts, at first, to turn putting the partially toothed upper end 20 of the spindle 8 into rotation through the toothed ring 3. The lower end of the spindle 8 carries a suitably shaped support hook 15 for one of the strips 16 of the blind.

The rotation of this spindle is obviously limited in amplitude by the circumferential extent of the teeth on its upper end 20. In fact, when the toothed ring 3 engages the continuous portion of the said upper end of the spindle 8 the rotation of the spindle and the corresponding toothed ring ceases since any possible further traction exerted on the teeth of the ring 7 cause solely a rotation of this latter against the

resistance of the resilient friction means 5.

In practice, after this rotational movement, further traction on the said toothed ring 7 causes translation of the box-like body 1 in one directional sense or the other causing the various strips of the blind to approach or become spaced from one another. The normal position of these strips is determined, obviously, by the length of the cable or chain which joins the box-like bodies together, which can vary in dependence on the specific requirements of use for the user. Moreover, the said friction clutch can be fitted, instead of on the first spindle 2, to the second spindle 8 with the necessary variation of providing the head of this latter also with a complete toothed wheel and by arranging a tooth for the necessary arrest of rotation thereof.

Moreover, in the case of an inclined spindle (Figure 1) there is provided, at the top of the prismatic body 1, a resilient tongue 17 which, by abutting against a projection 18 formed in the middle of the profile 12, improves the retention of the box-like body itself within this latter. In particular, this tongue is able to guarantee a perfect stability of the box-like body against the inevitable stressess transmitted by the movement of the displacement member.

The perfect mirror image symmetry of the section constituting the sliding track allows the box-like bodies to be introduced with the projecting portion 1' facing either the right (with reference to Figures 1 and 3) or towards the left that is to say with the box-like

body itself rotated through 180° with respect to its vertical axis. In this way box-like bodies with the toothed ring arranged for right hand movement of the slidable operating bodies 14 can be fitted on the right hand section of a track whilst bodies arranged with the teeth on the left can be fitted to the left hand section of the same track for sliding movement in the opposite sense from that of the right hand section.

Consequently, by arranging the said box-like bodies within the section constituting the track with some of them facing the right and some facing the left it is possible easily to provide a blind having a central opening. The presence of the said friction clutch likewise prevents breakage or wear phenomena on the slidable operating member 14 or the toothed ring 7 or sliding of the blind even in the case of prolonged and repeated adjustment.

From what has been explained above and from observation of the various Figures of the drawings attached the great functionality and practicality in use which characterise the operating mechanism for vertical strip blinds and constituting the subject of the present invention will be apparent.

Claims:

1. A mechanism for operating a vertical strip blind, characterised by the fact that it includes a first spindle (2') supported by a prismatic box-like body (1) of suitable shape, at one end (2) of which spindle (2') there is formed a toothed wheel (3) and on which is fitted, with the interposition of resilient biasing means (5), a hollow cylindrical element (6) provided with a circumferential projection (7) having external teeth; the toothed wheel (3) of the said first spindle (2') engages the partially toothed shaped end (20) of a second spindle (8) the axis of which is vertical, carrying a suitably shaped hook (15) for support of the strip which constitutes a part of the blind; the said prismatic box-like body (1) being housed, with the first spindle (2') disposed on one side or the other thereof in a sliding track (12) having mirror image symmetry about a vertical plane passing through its longitudinal axis, and provided with opposed guides (13) for the passage of a flexible control member (14) which is engageable with the toothed circumferential projection (7) formed on the hollow cylindrical element (6) which surrounds the first spindle (2').

2. A mechanism according to Claim 1, characterised by the fact that the said first spindle (2') is disposed obliquely with respect to the second spindle (8), and by the fact that the corresponding toothed and partially toothed wheels (3, 20) thereof

formed at their facing ends and meshing with one another are of conical or bevel wheel type.

3. A mechanism according to Claim 1 or Claim 2, characterised by the fact that it includes a suitably shaped prismatic box-like body (1) having an almost trapezoidal shape with a projecting portion (1') in which are formed seats for housing and support of the said first spindle (2') disposed with its axis inclined with respect to the vertical, there being perimetral teeth (3) on a base portion of this spindle in the form of a conical toothed ring above which pressess a fixed collar (4); the said first spindle (2') extending upwardly as a first cylindrical portion (2') followed by a second cylindrical portion (2")of smaller diameter.

4. A mechanism according to any of Claims 1 to 3, characterised by the fact that the said resilient biasing means (5) are constituted by a coil spring, or by a length of rubber tube, or by another functionally equivalent member suitably dimensionsed and positioned in compression for the purpose of serving as a friction clutch between the hollow cylindrical element (6) and the said collar (4).

5. A mechanism according to any preceding Claim, characterised by the fact that the said second spindle (8) is turnably housed in a seat formed at the base of the said box-like body (1) adjacent its projecting portion (1'); the portion of the box-like body (1) forming this seat further defining

external guides (10) for retaining the body (1) for sliding movement along the flanges of a C-shape profile (12) constituting the track of the blind.

6. A mechanism as claimed in any preceding Claim, characterised by the fact that the said sliding track is constituted by section (12) having a vertical plane of symmetry which has, on the inner faces of the two side walls two open channels (13) of suitable section for housing a slidable member (14) operable to cause rotation or drawing in either direction of the said toothed ring (7).

7. A mechanism according to any preceding Claim, characterised by the fact that the said slidable member (14) can be constituted by a cord or a chain carrying balls or ball means or other suitable projecting elements, or by a perforated band or the like operable to engage in traction with the toothed ring (7) and so shaped that the projecting elements or balls extend from the said channels (13) formed on the two sides of the section (12).

8. A mechanism according to one or more preceding Claim, characterised by the fact that the said friction clutch is fitted to the second spindle (8) instead of to the first spindle (2'), the head (20) of the said second spindle (8) being provided with a completely surrounding toothed wheel and having a tooth constituting an abutment stop for limiting the rotation thereof.

9. A mechanism according to any preceding Claim, characterised by the fact that at the upper part of the said prismatic box-like body there is formed a resilient tongue (17) which, by contacting a projection (18) formed in the middle of the section (12) constituting the sliding track, improves the retention of the box-like body itself within this latter.

Fig. 1

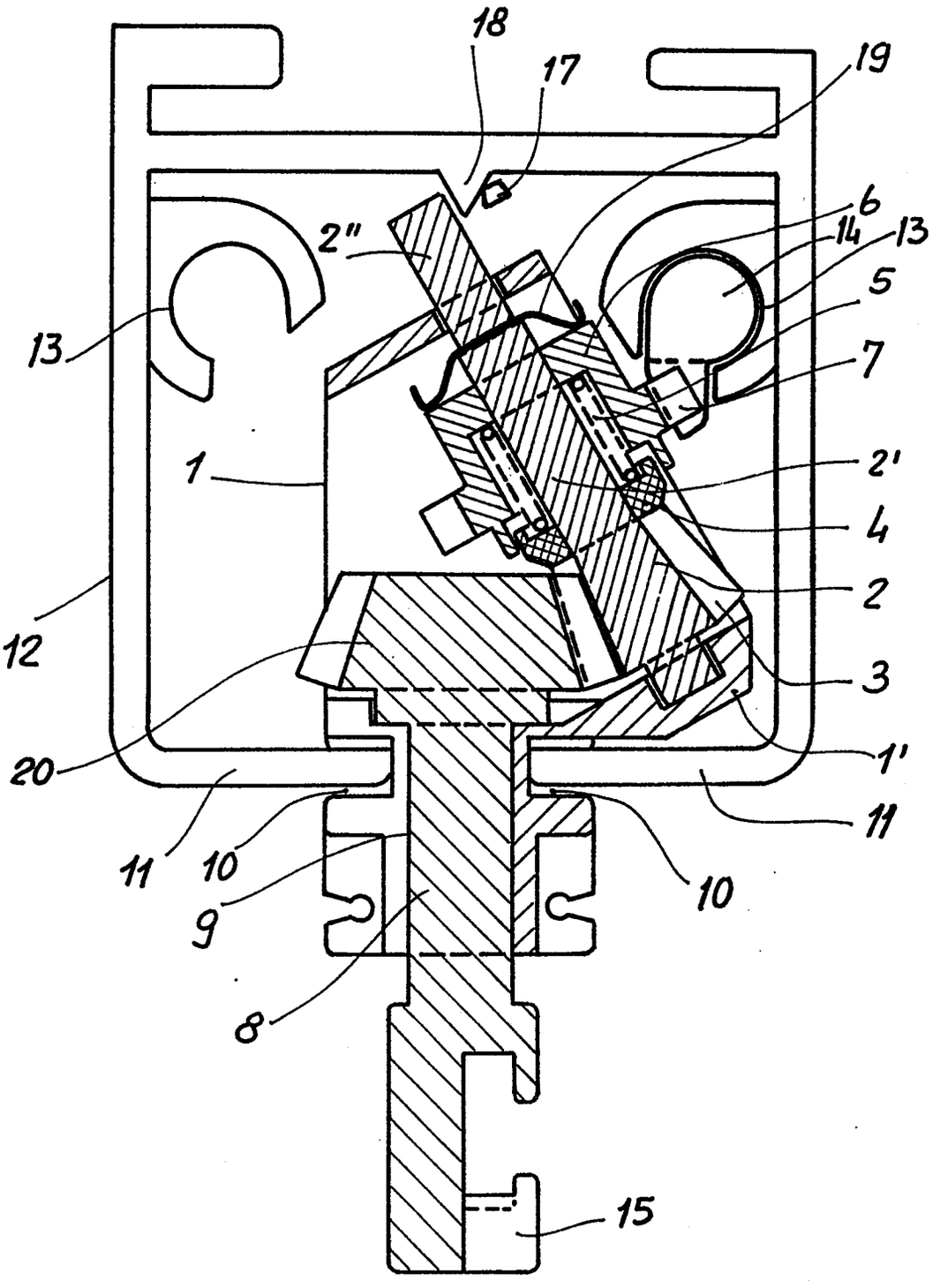
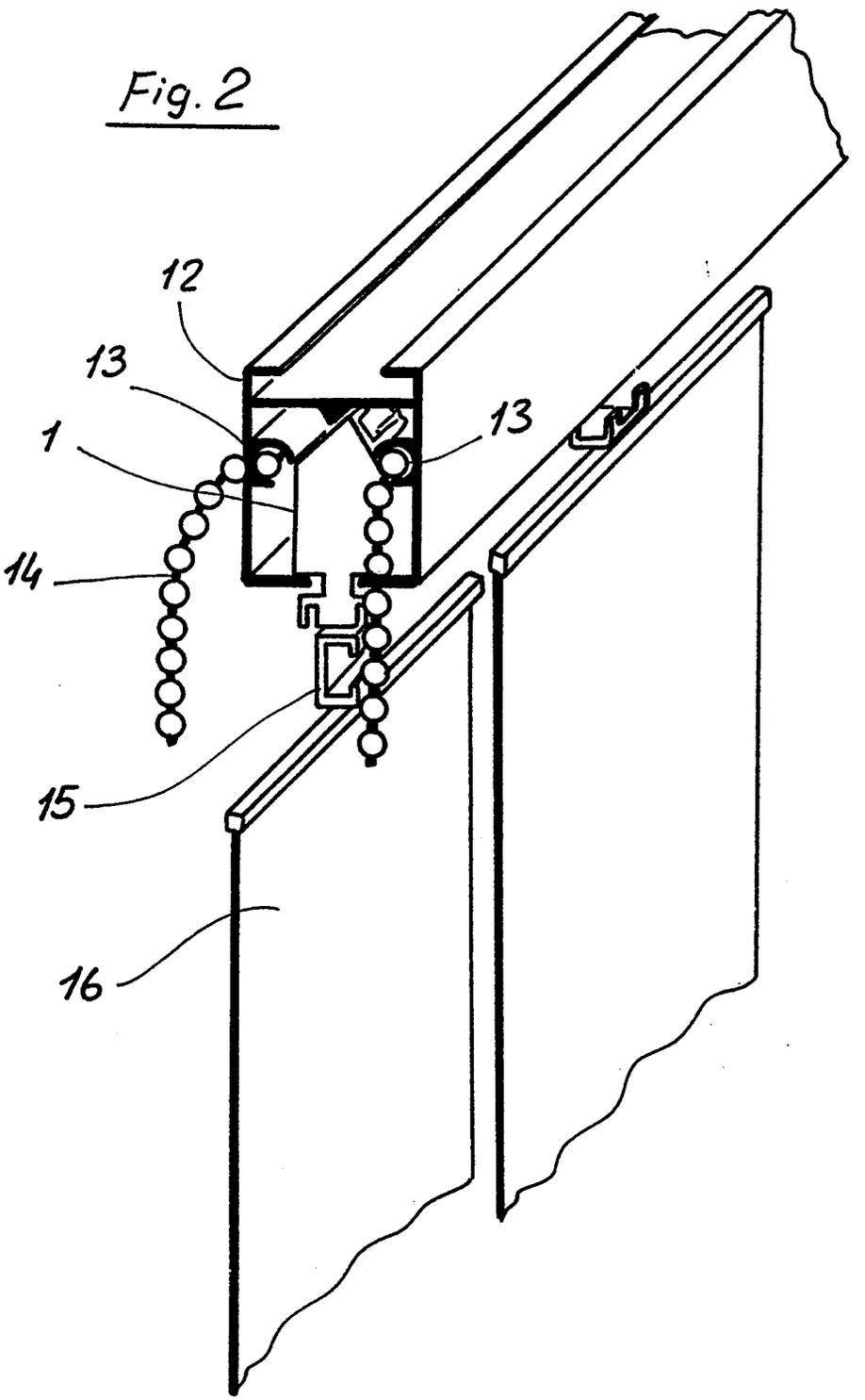


Fig. 2



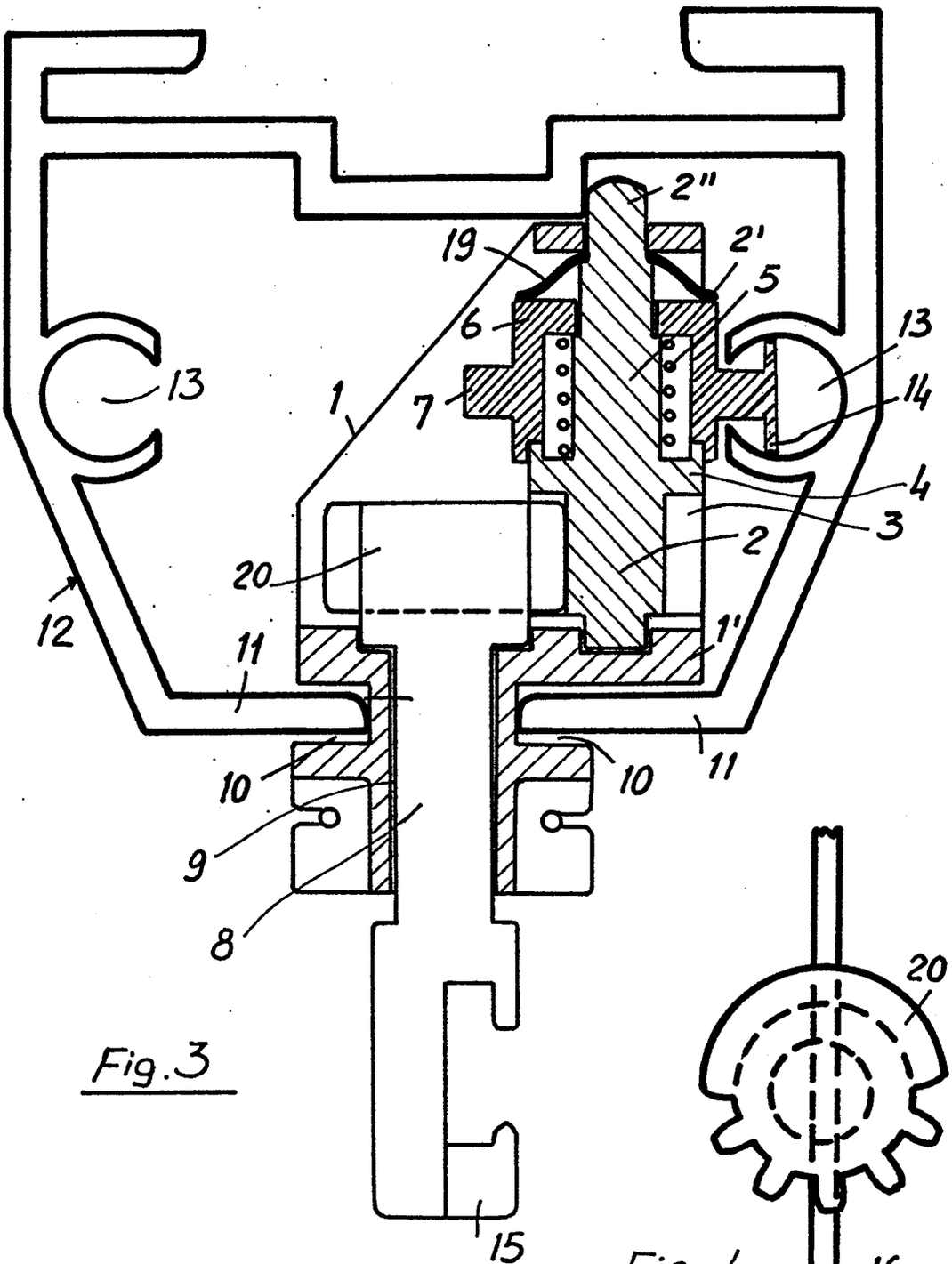


Fig. 3

Fig. 4