

PATENT SPECIFICATION

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(54) IMPROVEMENTS IN OR RELATING TO HINGES

(71) I, HEINZ DROOFF trading as PRAMETA PRÄZISIONSMETALL-UND KUNSTSTOFFERZEUGNISSE G. BAUMANN & CO. of 5 Köln 91, Hardtgenbuscher Kirchweg 111, Germany, a German citizen, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to hinges.

According to the present invention, there is provided a hinge comprising a first part for securing to a door frame and a second part for securing in a recess of a door leaf, said parts being connectable such that, when secured to said door frame and door leaf respectively, they allow pivoting of the door leaf with respect to the door frame, the hinge further comprising an elongate guideway for one arm of a first, two-armed lever which is connected to said second part, the guideway being securable to said first part and adjustable with respect to said first part in a direction extending perpendicularly to a base of said first part, said base being for securing said first part to said frame, and said guideway including two spaced-apart, elongate members in each of which is a track in which a member affixed to said one arm can run and pivot, the other arm of said lever being pivotably mounted on said second part, and there being a second, two-armed lever which is pivotable at one end to said first part, intermediate its ends to said first two-armed lever intermediate the ends thereof and to one end of an elongate link itself pivoted at its other end to said second part.

For a better understanding of the invention and to show how the same may be carried into effect, reference will now be made, by way of example, to the accompanying drawings, in which:—

Figure 1 is a diagrammatic plan view of a

hinge for a door, the hinge being shown on a door in a closed state,

Figure 2 is a view taken in the direction of the arrow II in Figure 1,

Figure 3 is a diagrammatic plan view of the hinge of Figure 1 with a leaf of the door upon which the hinge is mounted completely opened through 180°,

Figure 4 is a diagrammatic view of part of the hinge, taken in the direction of the arrow IV in Figure 3, and

Figure 5 is a diagrammatic view of part of the hinge, taken in the direction of the arrow V in Figure 3.

The hinge to be described with reference to the drawings is of the co-called "concealed" type and is particularly intended for use with furniture doors.

Referring to the drawings, the hinge 1 includes a first part 2 for securing as shown to a door frame 3, and also a second part 4 for securing as shown to a door leaf 5.

The part 4 has a well 4a and a screw plate 4b which, by means of screws 6, secures the part 4 on the leaf 5 with the well 4a sunken in a recess in the leaf.

The parts 2 and 4 are interconnected by a lever mechanism 7. This comprises a guide lever 8, which has two arms 8a and 8b. The arm 8a is connected to the hinge part 2 by means of a member affixed to it in the form of a pin 8c which can run in a track formed by slots 9a of an elongate guideway 9 fixed to the part 2. The other arm 8b is pivoted at a point 10 on the hinge part 4. The guideway 9 is constituted by two, spaced-apart parallel and elongate members 9b in each of which is one of the slots 9a. Thus, a head 8d of the lever arm 8a, which is flat, is able to extend between the members 9c, whilst its pin 8c extends through both slots 9a.

Another lever 11, which also has two arms, is pivotably connected at one end at a point 12 to the hinge part 2 and is pivotably connected to the hinge part 4 by way of an elongate, intermediate link 13 which is

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pivotably connected to the other end of the lever 11 at a pivot 16, there being a slot 17 in one end of the link 13 in which the pivot 16 can slide. The other end of the link 13 is pivoted at a point 14 to the hinge part 4. The levers 8 and 11 are articulated to one another intermediate their ends at a pivot point 15.

The lever arm 8a has a projection 8e along one edge, to ensure that at least a part of the arm 8 lies within the space 9c defined between the two spaced-apart members 9b of the guideway 9, even when the door leaf 5 is swung through 180° into a completely open position. In this way, twisting of the arm 8 under the action of bending forces is inhibited, because the arm is restrained from twisting and tilting at two spaced points, namely, at the head 8d and the projection 8e.

As shown, the track formed by the longitudinal slots 9a extends parallel to the door frame but it can also be of curvilinear form, for example, with a convexity facing the door frame 3. In this way, a swinging movement of the door leaf is made possible in such a way that the leaf does not interfere with an adjacent door leaf opened by 90°, the two door leaves bearing tightly one against the other when closed.

The hinge part 2 is advantageously formed, as shown, as a bracket with two triangular walls aligned with each other and facing each other, these walls being joined by a base extending between the bases of the walls and a cross-wall 2a joining the shortest sides of the walls just mentioned. The base joining the walls extends parallel to the frame 3 and is secured to the frame 3.

The guideway 9 is provided at one end with a projection 9d, which is pivotably connected at a point 12 to one end of one arm of the lever 11. The members 9b and the projection 9d are advantageously integral. The guideway 9 is removably mounted on the part 2 and is adjustable with respect to the part 2 in a direction extending perpendicularly to the part 2. For this purpose, the guideway is provided, in a block near its projection 9d, with two opposed grooves 9e, which engage in a slot formed in the cross-wall 2a of the hinge part 2, so that the guideway 9 can be displaced relatively to the hinge part 2 by means of a tongue and groove connection.

To secure the guideway 9 relatively to the hinge part 2, the block in which the grooves 9e are provided is split at 19 down one side and a threaded bore 14 is provided at the inner most portion of the split 19, a tapered locking screw 18 being screwed in the bore 14. Upon tightening of the screw 18 in the bore 14, the taper of the screw causes the split 19 to widen to cause the adjacent part of the block to bear against the cross-wall

2a and against one of two ribs 2b provided on the respective triangular walls of the hinge part 2 to prevent relative movement between the guideway 9 and hinge part 2.

An adjusting screw 20 is also provided, parallel to the sliding direction of the guideway 9 relative to the hinge part 2, in the block of the guideway 9, this screw extending through the block and being able to bear on the base of the hinge part 2 so that the screw 20 can define the spacing between the base and the guideway 9. After this position has been set, the locking screw 18 is tightened. The relative position of the part 2 and guideway 9 is therefore obtained by the adjusting screw 20 so that, if the door is taken off the frame and is again assembled, it will automatically regain its preset position relative to the hinge part 2 without requiring realignment.

WHAT I CLAIM IS:—

1. A hinge comprising a first part for securing to a door frame and a second part for securing in a recess of a door leaf, said parts being connectable such that, when secured to said door frame and door leaf respectively, they allow pivoting of the door leaf with respect to the door frame, the hinge further comprising an elongate guideway for one arm of a first, two-armed lever which is connected to said second part, the guideway being securable to said first part and adjustable with respect to said first part in a direction extending perpendicularly to a base of said first part, said base being for securing said first part to said frame, and said guideway including two spaced-apart, elongate members in each of which is a track in which a member affixed to said one arm can run and pivot, the other arm of said lever being pivotably mounted on said second part, and there being a second, two-armed lever which is pivotable at one end to said first part, intermediate its ends to said first two-armed lever intermediate the ends thereof and to one end of an elongate link itself pivoted at its other end to said second part.

2. A hinge as claimed in claim 1, wherein said track is a slot and said member is a pin of said one arm.

3. A hinge as claimed in claim 1 or 2, wherein said track of said guideway extend parallel to said base of said first part.

4. A hinge as claimed in claim 1 or 2, wherein said track of said guideway has a convexity which faces said base of said first part.

5. A hinge as claimed in any one of the preceding claims, wherein said one arm of said first, two-armed lever is a flat member which fits between said two spaced-apart, elongate members of said guideway and has a projection along one edge to ensure that



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5 pivotably connected to the other end of the lever 11 at a pivot 16, there being a slot 17 in one end of the link 13 in which the pivot 16 can slide. The other end of the link 13 is pivoted at a point 14 to the hinge part 4. The levers 8 and 11 are articulated to one another intermediate their ends at a pivot point 15.

10 The lever arm 8a has a projection 8e along one edge, to ensure that at least a part of the arm 8 lies within the space 9c defined between the two spaced-apart members 9b of the guideway 9, even when the door leaf 5 is swung through 180° into a completely open position. In this way, twisting of the arm 8 under the action of bending forces is inhibited, because the arm is restrained from twisting and tilting at two spaced points, namely, at the head 8d and the projection 8e.

20 A shown, the track formed by the longitudinal slots 9a extends parallel to the door frame but it can also be of curvilinear form, for example, with a convexity facing the door frame 3. In this way, a swinging movement of the door leaf is made possible in such a way that the leaf does not interfere with an adjacent door leaf opened by 90°, the two door leaves bearing tightly one against the other when closed.

25 The hinge part 2 is advantageously formed, as shown, as a bracket with two triangular walls aligned with each other and facing each other, these walls being joined by a base extending between the bases of the walls and a cross-wall 2a joining the shortest sides of the walls just mentioned. The base joining the walls extends parallel to the frame 3 and is secured to the frame 3.

30 The guideway 9 is provided at one end with a projection 9d, which is pivotably connected at a point 12 to one end of one arm of the lever 11. The members 9b and the projection 9d are advantageously integral. The guideway 9 is removably mounted on the part 2 and is adjustable with respect to the part 2 in a direction extending perpendicularly to the part 2. For this purpose, the guideway is provided, in a block near its projection 9d, with two opposed grooves 9e, which engage in a slot formed in the cross-wall 2a of the hinge part 2, so that the guideway 9 can be displaced relatively to the hinge part 2 by means of a tongue and groove connection.

35 To secure the guideway 9 relatively to the hinge part 2, the block in which the grooves 9e are provided is split at 19 down one side and a threaded bore 14 is provided at the inner most portion of the split 19, a tapered locking screw 18 being screwed in the bore 14. Upon tightening of the screw 18 in the bore 14, the taper of the screw causes the split 19 to widen to cause the adjacent part of the block to bear against the cross-wall

2a and against one of two ribs 2b provided on the respective triangular walls of the hinge part 2 to prevent relative movement between the guideway 9 and hinge part 2.

70 An adjusting screw 20 is also provided, parallel to the sliding direction of the guideway 9 relative to the hinge part 2, in the block of the guideway 9, this screw extending through the block and being able to bear on the base of the hinge part 2 so that the screw 20 can define the spacing between the base and the guideway 9. After this position has been set, the locking screw 18 is tightened. The relative position of the part 2 and guideway 9 is therefore obtained by the adjusting screw 20 so that, if the door is taken off the frame and is again assembled, it will automatically regain its preset position relative to the hinge part 2 without requiring realignment.

WHAT I CLAIM IS:—

1. A hinge comprising a first part for securing to a door frame and a second part for securing in a recess of a door leaf, said parts being connectable such that, when secured to said door frame and door leaf respectively, they allow pivoting of the door leaf with respect to the door frame, the hinge further comprising an elongate guideway for one arm of a first, two-armed lever which is connected to said second part, the guideway being securable to said first part and adjustable with respect to said first part in a direction extending perpendicularly to a base of said first part, said base being for securing said first part to said frame, and said guideway including two spaced-apart, elongate members in each of which is a track in which a member affixed to said one arm can run and pivot, the other arm of said lever being pivotably mounted on said second part, and there being a second, two-armed lever which is pivotable at one end to said first part, intermediate its ends to said first two-armed lever intermediate the ends thereof and to one end of an elongate link itself pivoted at its other end to said second part.

2. A hinge as claimed in claim 1, wherein said track is a slot and said member is a pin of said one arm.

3. A hinge as claimed in claim 1 or 2, wherein said track of said guideway extend parallel to said base of said first part.

4. A hinge as claimed in claim 1 or 2, wherein said track of said guideway has a convexity which faces said base of said first part.

5. A hinge as claimed in any one of the preceding claims, wherein said one arm of said first, two-armed lever is a flat member which fits between said two spaced-apart, elongate members of said guideway and has a projection along one edge to ensure that



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at least a part of this arm lies at all times within the space between said two spaced-apart members of the guideway.

5 6. A hinge as claimed in any one of the preceding claims, wherein said first part includes two triangular walls aligned with each other and facing each other, these walls being joined by said base which extends between the bases of the walls and which is securable to said frame such that it extends parallel to the frame.

10 7. A hinge as claimed in any one of the preceding claims, wherein said guideway is provided at one end with a projection which is pivotably connected to said one end of said second, two-armed lever, this projection and said guideway being integral with one another.

15 8. A hinge as claimed in claim 7, wherein the adjustability of said guideway on said first part is provided by means of a part of said guideway which can run in grooves of said first part, there being a locking screw in said part of said guideway to secure said guideway relatively to said first part in positions of said guideway along said grooves of said first part.

20 9. A hinge as claimed in claim 8 and further comprising an adjusting screw in

said part of said guideway and extending parallel to the sliding direction of said guideway in said grooves of said first part, this screw serving to define a desired position of said guideway relatively to said first part.

10. A hinge, substantially as hereinbefore described with reference to the accompanying drawings.

11. An article of furniture having a hinge as claimed in any one of the preceding claims.

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HASELTINE, LAKE & CO.,
Chartered Patent Agents,
Hazlitt House,
28, Southampton Buildings,
Chancery Lane,
London WC2A 1AT,
also
Temple Gate House,
Temple Gate,
Bristol BS1 6PT,
and
9, Park Square,
Leeds LS1 2LH,
Yorks.
Agents for the Applicant.

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