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(71) Applicant: **UAP Limited**
Whitefield, Manchester M45 8EH (GB)

(72) Inventors:
- **JENNINGS, David**
Manchester, M45 8EH (GB)
- **MCLOUGHLIN, John**
Manchester, M45 8EH (GB)

(74) Representative: **Meissner Bolte UK**
4a Top Land Country Business Park
Cragg Vale
Hebden Bridge HX7 5RW (GB)

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(54) IMPROVEMENTS TO LETTER PLATES

(57) A letter-plate (1) is provided that comprises a frame (14), a sleeve (9) and a first flap (7). The frame (14) is adapted to be fitted around an aperture (5) on an exterior side of a door (4). The sleeve (9) defines an inlet (10) and an outlet (11) on exterior and interior sides respectively of the letter-plate (1) and, in use, is adapted to line the interior of the aperture (5). The sleeve (9) is also arranged at an oblique angle (*a*) to a vertical plane of the door (4) and thereby to said frame (14). The first flap (7) is pivotally mounted to cover the outlet (11) of the sleeve (9) on the interior side of the letter-plate (1). Pivotal movement of the flap (7) relative to the sleeve (9) is restricted by at least one stay (34, 35) connected between the flap (7) and a component (36) of the letter-plate (1) in order to control the maximum angle (b) to which the flap (7) can pivot relative to the outlet (11) of the sleeve (9). Preferably, maximum opening of the first flap (7) is restricted to a maximum angle (b) that is equal to or less than 60°. In addition, preferably the sleeve (9) extends at an oblique angle (*a*) of between 70° and 75° inclusive to said vertical plane of the door when the letter-plate is in use and slopes downwards from the exterior side to the interior side of the letter-plate (1).

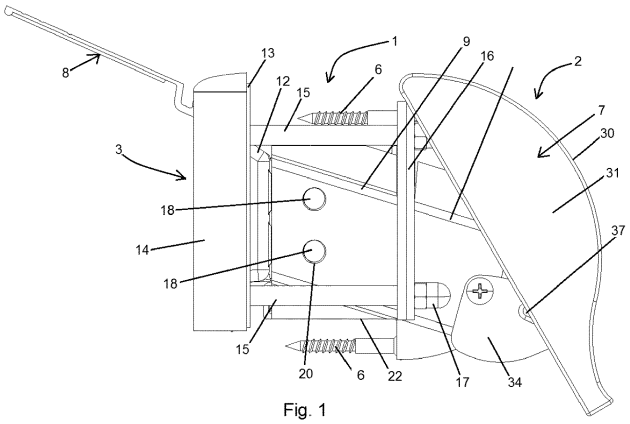

Fig. 1

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Description

[0001] The present invention relates to letter-plates.

[0002] Conventionally a letter-plate comprises a pair of frames with interengaging sleeves that are fitted together through both sides of an aperture cut into a door to accommodate same. The letter-plate finishes the aperture and provides one or more flaps and/or brushes to cover the framed aperture and thereby protect the space on, for example, an interior side of the door from the weather on the exterior side of the door whilst enabling letters and small packets to be pushed through the framed aperture. Usually a spring-loaded flap that is biased into a closed position covering the aperture is used on the exterior side of the door and a second flap or brushes are used to cover the aperture on the interior side of the door.

[0003] However, a letter-plate can provide access through a locked door for thieves and other criminals to fish and thereby gain illicit access to the lock mechanisms, keys and other valuable items on an interior side of the door. The Door & Hardware Federation (DHF) has issued Technical Specification TS008:2015 which specifies enhanced security requirements for letter-plates. This document defines security requirements that letter-plates should meet against fishing attacks within an overall specified test time while still allowing mail packets of a specified maximum size, known as "gauge mail", to be posted through the letter-plate. The fishing attacks that have to be taken into account include attacks using rods, bent wires and the like and also attacks that involve inserting an arm through the aperture defined by the letter-plate to reach keys inserted in an adjacent lock or to manually rotate a thumb-turn of the lock.

[0004] It is an object of the present invention to provide a letter-plate that meets these security requirements.

[0005] According to the present invention there is provided a letter-plate comprising

> a frame that is adapted to be fitted around an aperture on an exterior side of a door;
> a sleeve defining an inlet and an outlet on exterior and interior sides respectively of the letter-plate and that, in use, is adapted to line the aperture's interior and to be arranged at an oblique angle to a vertical plane of the door and thereby to said frame; and
> a first flap that is pivotally mounted to cover the outlet of the sleeve on the interior side of the letter-plate; and wherein
> pivotal movement of the flap relative to the sleeve is restricted by at least one stay connected between the flap and a component of the letter-plate in order to control the maximum angle to which the flap can pivot relative to the outlet of the sleeve.

[0006] Preferably, the maximum angle is equal to or less than 60° with respect to said vertical plane of the door.

[0007] Preferably also, the sleeve extends at an oblique angle of between 70° and 75° inclusive to said vertical plane of the door when the letter-plate is in use and slopes downwards from the exterior side to the interior side of the letter-plate.

[0008] Preferred additional features of the invention are described in the dependent claims appended hereto.

[0009] The present invention will now be described by way of example with reference to the accompanying drawings, in which:-

> Fig. 1 is a side view of a letter-plate in accordance with the present invention, first and second flaps thereof being shown open;
>
> Fig. 2 is a view similar to Fig. 1 but showing interior and exterior sub-assemblies of the letter-plate prior to connection together;
>
> Fig. 3 is a vertical, transverse cross-section through that part of a door to which the letter plate shown in Figs. 1 and 2 has been fitted, the first and second flaps being shown open;
>
> Fig. 4 is a view similar to Fig. 3 but showing the letter-plate with the first and second flaps closed and to a slightly enlarged scale;
>
> Fig. 5 is a perspective view from one side and below of the interior sub-assembly with the first flap thereof shown open;
>
> Fig. 6 is a view to an enlarged scale of part of Fig. 5 and with a side wall of the first flap removed to reveal underlying detail;
>
> Fig. 7 is a view is a view similar to Fig. 6 but showing the interior sub-assembly with the first flap removed and with a pair of stays shown in a position were the first flap to be present and open; and
>
> Fig. 8 is a view similar to Fig, 7 but showing the pair of stays in a position were the first flap to be present and closed.

[0010] The embodiment of letter-plate 1 shown in the drawings comprises interior and exterior sub-assemblies 2 and 3 that are adapted to be fitted respectively on interior and exterior sides of a door 4, as shown in Figs. 3 and 4, to surround and line an aperture 5 cut through the door 4. The sub-assemblies 2, 3 are adapted to be connected together through the aperture 5 in the door 4 as is described in more detail below. In addition, the interior sub-assembly 2 is adapted to be secured to the door by a plurality of screws 6 that are located above and below the aperture 5. First and second flaps 7 and 8 are also provided as part of each sub-assembly 2 and 3 respectively and are pivotally mounted so that in use they cover

the aperture 5 on the interior and exterior sides of the door 4. In addition, a sleeve 9 is provided that defines an inlet 10 and an outlet 11 on exterior and interior sides respectively of the letter-plate 1. The sleeve 9 lines the interior of the aperture 5 and is arranged at an oblique angle *a* to a vertical plane of the door 4. Preferably, the sleeve 9 extends at an angle *a* of between 70° and 75° inclusive to the vertical plane of the door 4 and slopes downwards from the exterior side to the interior side of the letter-plate 1. In addition, the upper part of the sleeve 9 projects outwards from the interior side of the door 4 as an additional security measure. This projection of the sleeve 9 is covered by and accommodated within the interior flap 7 when the latter is closed. At its other end the sleeve 9, which primarily forms part of the interior sub-assembly 2, aligns with a short exterior portion 12 that is defined by an insert 13 forming part of the exterior sub-assembly 3.

[0011] The reason for the oblique angle of the sleeve 9 is to make it difficult for fishing through it to occur and to be successful. Fishing implements or an arm inserted into the sleeve 9 are directed downwards and therefore away from adjacent door latches and locks. In addition, the height *H* of the sleeve 9 perpendicular to its size is restricted, preferably to between 30mm and 35mm inclusive. In most cases it is expected that the height *H* of the sleeve 9 will be 32 mm. The sleeve 9 is therefore of sufficient size to allow gauge mail to pass through it but sufficiently restricted in height to make passage of the arm of most people through it impossible and fishing using implements more difficult. Fishing using implements and tools is also made more difficult by restricting the pivotal movement of the flap 7 of the interior sub-assembly 2, as is described in more detail below,

[0012] The construction of both of the sub-assemblies 2, 3 and how they are connected together in the assembled letter-plate 1 will now be described in more detail.

[0013] The exterior sub-assembly 3 is the simpler in construction than the interior sub-assembly 2 and is not designed to be independently secured to the door 4 but only to the interior sub-assembly 2. It is therefore connected to the interior sub-assembly 2 after the latter has been secured to the door 4. It comprises a frame 14 that is adapted to fit snugly around the periphery of the aperture 5 on the exterior side of the door 4. The insert 13 locates within the frame 5 and pairs of bolts 15 extend from the frame 14 through the insert 13 at respective sides thereof and to enable the sub-assembly 3 to be bolted to the interior sub-assembly 2 through the aperture 5 around the exterior of the sleeve 9. The bolts 15 pass through holes in a second frame 16 forming part of the interior sub-assembly 2 before being secured to the latter by nuts 17 or, in a modified arrangement, by screws that locate in threaded tubes used in place of the bolts 15. In addition to the bolts 15, the exterior sub-assembly 3 is also secured to the interior sub-assembly 2 by two types of resilient, projecting fasteners 18 and 19 that are adapted to snap-fit to complementarily-shaped portions 20 and 21 respectively of the main part of the sleeve 9. The fasteners 18, 19 project from the insert 13 and their snap-fitment to the sleeve 9 aligns the apertures defined by the sleeve 9 and the portion 12 of the insert 13 to ensure that an unimpeded chute is formed through the door 4.

[0014] The fasteners 18 comprise two pairs of projecting, resilient fingers that have nodules at their ends which engage within holes 20 defined in the sides of the sleeve 9 that are of a complementary shape in which the nodules will fit. The fasteners 19 comprise resilient hooks that are spaced along the lower part of the insert 3 below the sleeve portion 12 and snap-fit behind an upstanding flange 21 formed at the end of a tray 22 that is integrally formed with and, in use, projects horizontally below the sleeve 9. The tray 22 is designed to sit adjacent the lower surface of the aperture 5, typically over an intumescent strip (not shown). The tray 22 and the sleeve 9 are conjoined at the outlet 11, which flares outwardly and defines a lip 23 which locates around the interior, lower edge of the aperture 5. The lower screws 6 below the aperture 5 pass through the lip 23, thereby securing the sleeve 9 to the door, whereas the upper screws 6 above the aperture 5 pass through the frame 16, thereby also securing this firmly to the door 4.

[0015] The flap 8 is pivotally mounted to the upper edge of the frame 14 and when closed it covers both the aperture 5 and the whole of the insert 13. Preferably, the flap 8 is provided with a closure mechanism that biases it into a closed position so that it complies with relevant standards and does not rattle in the wind. As such mechanisms are conventional they will not be described herein. However, in accordance with Technical Specification TS008:2015, the flap 8 is capable of withstanding attempts to pull it off the frame 14. This is because the frame 14 comprises a hooked upper edge 24 adjacent the pivotal mounting of the flap 8 , which edge 24 covers the pivots 25 and engages into a recess 26 provided along the entire length of the flap 8 when the flap 8 pivots open. This arrangement allows the flap 8 to withstand a 1kN pull test as specified in the aforesaid Technical Specification TS008:2015.

[0016] The flap 7 of the interior sub-assembly 2 will now be described in more detail. It is pivotally mounted to the frame 16 by two spring-loaded pivot pins 27 attached to the frame 16 that locate in engagement holes 28 in the flap 7. The spring-loading 29 holds the pins 27 in place while facilitating assembly of the letter-plate 1 by providing flexibility in the order in which the various components can be assembled. The flap 7 is shaped so that when closed it covers the whole of the frame 16 and the projecting sleeve 9 and therefore the aperture 5. To this end, the flap 7 comprises a curved outer wall 30 with two side walls 31 that are secured to the outer wall 30 by grub screws 32 that screw into complementary engagement holes in the side walls 31. The screws 32 may have a thread-locking compound pre-applied to their threads so that once screwed tight they lock the side walls 31 to the flap 7.

[0017] It will be appreciated that the flap 7 defines an interior space in which the frame 16 and the end of the sleeve 9 are accommodated when the flap 7 is closed. However, the flap 7 is also designed to direct mail posted through the letter-plate 1 downwards as it exits from the outlet 11 of the sleeve 9. It is therefore provided with an inner wall 33 that is preferably integrally formed with the outer wall 30. The inner wall 33 is located adjacent the lower free edge 34 of the flap 7 and extends upwards over the lower part of the interior surface of the outer wall 30. This prevents mail from being caught within the interior recess defined by the wall 30. The inner wall 33 also provides strength and rigidity to the flap 7.

[0018] As indicated above, the pivotal movement of the flap 7 is also restricted. This is accomplished by stays, and preferably by at least one and more preferably by two pairs of stays 34, 35. Each pair of stays, 34, 35 is connected between the flap 7 and one of two projecting extensions 36 respectively formed at the two sides of the sleeve 9. The fingers 18 are also accommodated within this extension 36. The stay 34 is pivotally mounted to the extension 36 and defines a slot 37 along which a projecting portion 38 of the second stay 35 slides when the flap 7 is opened and closed. The projecting portion 38 is preferably a pin that is carried by the side wall 31 of the flap 7 and retained within the slot 37 by a washer 39 and cap 40 that is secured to a free end of the pin 38 projecting through the slot 37. It will be appreciated that the side wall 31 and the stay 34 lie parallel to one another. The pin 38 may be threaded or left smooth on its exterior. If threaded, it has thread-locking compound applied to it so that it does not disconnect from the flap 7 after securement thereto.

[0019] It will be appreciated that the location and length of the slot 37 relative to the flap 7 thereby controls the maximum angle to which the flap 7 can pivot open relative to the outlet 11 of the sleeve 9. Figs. 1 and 3 both show the maximum extent to which the flap 7 can open. Preferably, the flap 7 cannot pivot sufficiently to clear the upper, projecting portion of the sleeve 9 so that the actual opening through which mail egresses from the letter-plate 1 directs the mail downwardly, the flap 7 and the side walls 31 providing a shield to the areas above and to the sides of the letter-plate 1. This severely restricts the freedom to conduct fishing attacks and makes it hard for fishers to access adjacent locks and much beyond the interior surface of the door 4. Preferably, the stay 34 also has an enlarged shape below the slot 37 to provide a further shield at the sides of the flap 7 when it is open. When closed, the stays 34, 35 are covered by the flap 7.

[0020] Preferably, pivotal movement of the flap 7 relative to the sleeve 9 is restricted such that the maximum opening angle of the flap 7 is limited to an angle b that is equal to or less than 60° with respect to said vertical plane of the door 4. Advantageously the angle b is between 45° and 60° inclusive.

[0021] It will be appreciated by persons skilled in the art that the arrangement of stays 34, 35 described above can be varied in many ways and the present invention is not restricted to the arrangement described and illustrated herein.

[0022] In use, the letter- plate 1 is fitted to the door 4 by first inserting the sleeve 9 of the interior sub-assembly 2 into the aperture 5 from the interior side of the door. At this point or even before the previous set the flap 7 can be disconnected from the sub-assembly 2, if necessary, to provide better access to the various fixing mechanisms but in most cases it is not thought that this will be necessary. The stays 34 and 35 are connected together and to the flap 7 but are disconnected from the sleeve extension 36. After insertion of the sleeve 9 into the aperture 5, the frame 16 and the lip 23 of the sleeve are screwed to the door 4 to secure the sub-assembly in place. The exterior sub-assembly 3 is then positioned on the exterior side of the door 4 and the exterior portion 12 of the sleeve 9 inserted into the aperture 5 to align with the sleeve 9. On insertion into the aperture 5, the fingers 18 locate into the sleeve extensions 36 on each side of the sleeve 9 and the nodules at their ends snap-fit into the holes 20. At the same time the hooks 19 slip over and grip the flange 21. The two sub-assemblies 2, 3 are now connected and aligned. They are then more permanently connected by attaching the nuts 17 to the bolts 15, or alternatively screwing the screws into the threaded rods, and making them fast. The stay or stays 34 are then connected to the sleeve extension 36 by a screw or screws such that they can pivot when the flap 7 opens and closes. Finally, the flap 7, if previously removed, is pivotally attached to the frame 16 by inserting the pivot pins 27 into the engagement holes 28. The letter-plate 1 is now assembled and in position ready for use.

[0023] It will be appreciated that the combination of the obliquely extending sleeve 9 the flap 7, which is only permitted to pivot sufficiently to allow gauge mail to pass through the sleeve 9, enables the letter-plate 1 to hinder fishing in a simple yet effective fashion while still permitting gauge mail to be posted through it without difficulty.

Clauses

[0024]

1. A letter-plate comprising

a frame that is adapted to be fitted around an aperture on an exterior side of a door;

a sleeve defining an inlet and an outlet on exterior and interior sides respectively of the letter-plate and that, in use, is adapted to line the aperture's interior and to be arranged at an oblique angle to a vertical plane of the door and thereby to said frame; and

a first flap that is pivotally mounted to cover the outlet of the sleeve on the interior side of the letter-plate; and wherein

pivotal movement of the flap relative to the

sleeve is restricted by at least one stay connected between the flap and a component of the letter-plate in order to control the maximum angle to which the flap can pivot relative to the outlet of the sleeve.

2. A letter-plate as claimed in Clause 1, wherein the maximum angle is equal to or less than 60° with respect to said vertical plane of the door.

3. A letter-plate as claimed in Clause 2, wherein the maximum angle is between 45° and 60° inclusive.

4. A letter-plate as claimed in any of Clauses 1 to 3, wherein said component of the letter-plate comprises a projecting side portion of the sleeve.

5. A letter-plate as claimed in any of Clauses 1 to 4, wherein the pivotal movement of the first flap is restricted by at least one pair of stays, a first stay of each pair being pivotally mounted and defining a slot along which a projecting portion of a second stay of each pair slides when the first flap is opened and closed.

6. A letter-plate as claimed in Clause 5, wherein two pairs of stays are provided that are respectively connected between opposing sides of the first flap and said component or respective components of the letter-plate adjacent said sides of the first flap.

7. A letter-plate as claimed in Clause 5 or Clause 6, wherein the first stay of each pair is pivoted to said component and the second stay of each pair comprises a projecting pin that is carried by a side wall of the first flap, which side wall lies parallel to said first stay.

8. A letter-plate as claimed in Clause 7, wherein the first stay has an enlarged shape below the slot to provide a shield at the side of the first flap when it is open.

9. A letter-plate as claimed in any of Clauses 1 to 8, wherein the sleeve extends at an oblique angle of between 70° and 75° inclusive to said vertical plane of the door when the letter-plate is in use and slopes downwards from the exterior side to the interior side of the letter-plate.

10. A letter-plate as claimed in any of Clauses 1 to 9, wherein the height of the sleeve perpendicular to its sides is between 30mm and 35mm inclusive.

11. A letter-plate as claimed in any of Clauses 1 to 10, wherein said height of the sleeve is 32 mm.

12. A letter-plate as claimed in any of Clauses 1 to 11, wherein the first flap comprises an outer wall and an inner wall that is located adjacent a free lower edge of the first flap when in use and that extends upwards to at least partially cover the interior surface of the outer wall in order to direct mail posted through the letter-plate downwards as it exits from the outlet of the sleeve.

13. A letter-plate as claimed in Clause 12, wherein the first flap is provided with side walls whereby the flap and the side walls form a shield limiting access via the sleeve to the areas above and to the sides of the interior side of the letter-plate.

14. A letter-plate as claimed in any of Clauses 1 to 13, wherein interior and exterior sub-assemblies are provided that in use are connected together through the aperture in the door.

15. A letter-plate as claimed in Clause 14, wherein the interior and exterior sub-assemblies are connected together by resilient fasteners that project from one of the sub-assemblies and that snap-fit to complementarily-shaped portions of the other of the sub-assemblies.

16. A letter-plate as claimed in Clause 14 or Clause 15, wherein the interior and exterior sub-assemblies are additionally connected by screw-threaded fasteners.

17. A letter-plate as claimed in any of Clauses 1 to 16, wherein a second flap is provided that is pivotally mounted to said frame on the exterior side of the letter-plate and that covers the inlet of the sleeve.

18. A letter-plate as claimed in Clause 17, wherein the frame on the exterior side of the letter-plate comprises a hooked edge adjacent the pivotal mounting of the second flap, which hooked edge engages in a recess provided along the entire length of the second flap when the second flap pivots open.

Claims

1. A letter-plate (1) to line an aperture in a door, wherein the aperture connects the interior and exterior sides of the door, and the height of the aperture above the ground on the interior side of the door and the height of the aperture on the exterior side of the door above the ground is the same, the letterplate comprising:

a frame (14) that is adapted to be fitted around the aperture (5) on an exterior side of a door (4);
a sleeve (9) defining an inlet (10) and an outlet (11) on exterior and interior sides respectively of the letter-plate (1) and that, in use, is adapted

to line the aperture's interior and to be arranged at an oblique angle to a vertical plane of the door (4) and thereby to said frame (14); and
a first flap (7) that is pivotally mounted to cover the outlet (11) of the sleeve (9) on the interior side of the letter-plate (1); and wherein
pivotal movement of the flap relative to the sleeve is restricted by at least one stay connected between the flap and a component of the letter-plate in order to control the maximum angle to which the flap can pivot relative to the outlet of the sleeve.

2. A letter-plate (1) as claimed in Claim 1, wherein the maximum angle is equal to or less than 60° with respect to said vertical plane of the door (4).

3. A letter-plate (1) as claimed in Claim 2, wherein the maximum angle is between 45° and 60° inclusive.

4. A letter-plate (1) as claimed in any of Claims 1 to 3, wherein said component of the letter-plate (1) comprises a projecting side portion of the sleeve (9).

5. A letter-plate as claimed in any of Claims 1 to 4, wherein the pivotal movement of the first flap is restricted by at least one pair of stays, a first stay of each pair being pivotally mounted and defining a slot along which a projecting portion of a second stay of each pair slides when the first flap is opened and closed.

6. A letter-plate (1) as claimed in Claim 5, wherein two pairs of stays (34, 35) are provided that are respectively connected between opposing sides of the first flap (7) and said component or respective components of the letter-plate (1) adjacent said sides of the first flap (7).

7. A letter-plate (1) as claimed in Claim 1 or Claim 2, wherein the first stay (34) of each pair is pivoted to said component and the second stay (35) of each pair comprises a projecting pin (38) that is carried by a side wall of the first flap (7), which side wall (31) lies parallel to said first stay (34).

8. A letter-plate (1) as claimed in Claim 6, wherein the first stay (34) has an enlarged shape below the slot (37) to provide a shield at the side of the first flap (7) when it is open.

9. A letter-plate (1) as claimed in any of Claims 1 to 8, wherein the sleeve (9) extends at an oblique angle of between 70° and 75° inclusive to said vertical plane of the door (4) when the letter-plate (1) is in use and slopes downwards from the exterior side to the interior side of the letter-plate (1).

10. A letter-plate (1) as claimed in any of Claims 1 to 9, wherein the height of the sleeve (9) perpendicular to its sides is between 30mm and 35mm inclusive.

11. A letter-plate (1) as claimed in any of Claims 1 to 9, wherein said height of the sleeve (9) is 32 mm.

12. A letter-plate as claimed in any of Claims 1 to 11, wherein the first flap comprises an outer wall and an inner wall that is located adjacent a free lower edge of the first flap when in use and that extends upwards to at least partially cover the interior surface of the outer wall in order to direct mail posted through the letter-plate downwards as it exits from the outlet of the sleeve.

13. A letter-plate (1) as claimed in Claim 12, wherein the first flap (7) is provided with side walls (31) whereby the flap (7) and the side walls (31) form a shield limiting access via the sleeve (9) to the areas above and to the sides of the interior side of the letter-plate (1).

14. A letter-plate (1) as claimed in any of Claims 1 to 13, wherein interior and exterior sub-assemblies (2, 3) are provided that in use are connected together through the aperture (5) in the door (4), optionally wherein the interior and exterior sub-assemblies (2, 3) are connected together by resilient fasteners (18, 19) that project from one of the sub-assemblies (2, 3) and that snap-fit to complementarily-shaped portions (20, 21) of the other of the sub-assemblies (2, 3), optionally, wherein the interior and exterior sub-assemblies (2, 3) are additionally connected by screw-threaded fasteners.

15. A letter-plate (1) as claimed in any of Claims 1 to 14, wherein a second flap (8) is provided that is pivotally mounted to said frame (14) on the exterior side of the letter-plate (1) and that covers the inlet (10) of the sleeve (9), wherein preferably the frame (14) on the exterior side of the letter-plate (1) comprises a hooked edge (24) adjacent the pivotal mounting of the second flap (8), which hooked edge (24) engages in a recess (26) provided along the entire length of the second flap (8) when the second flap (8) pivots open.

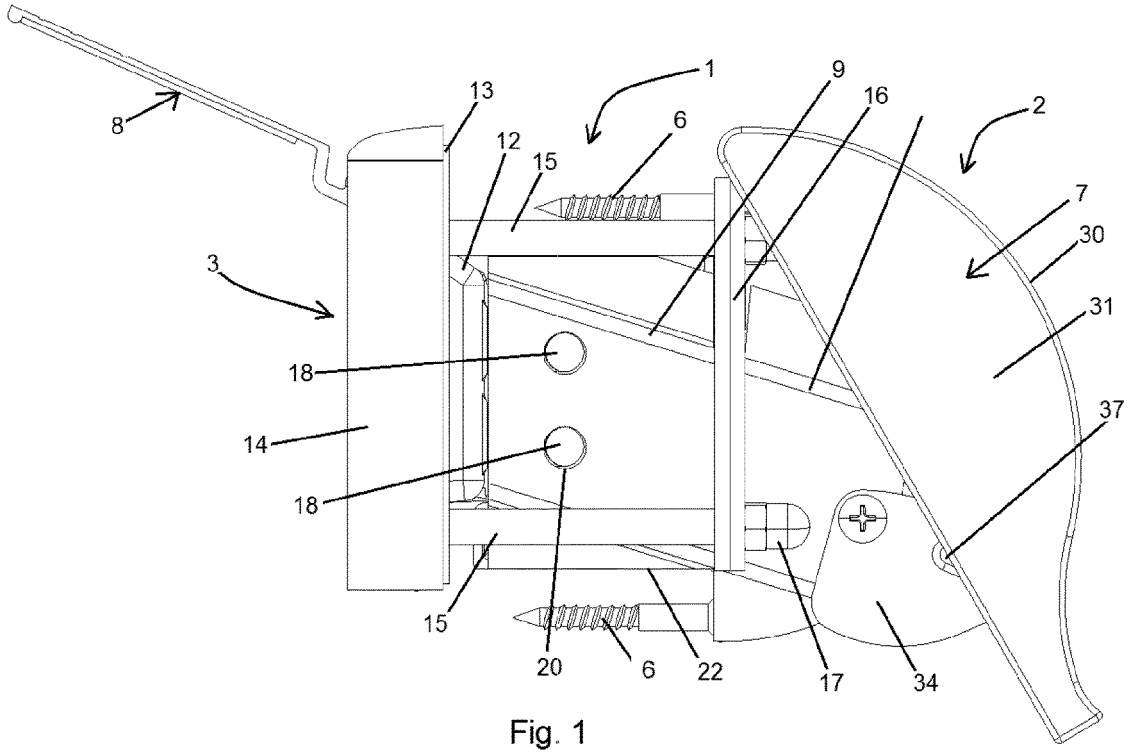
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Fig. 1

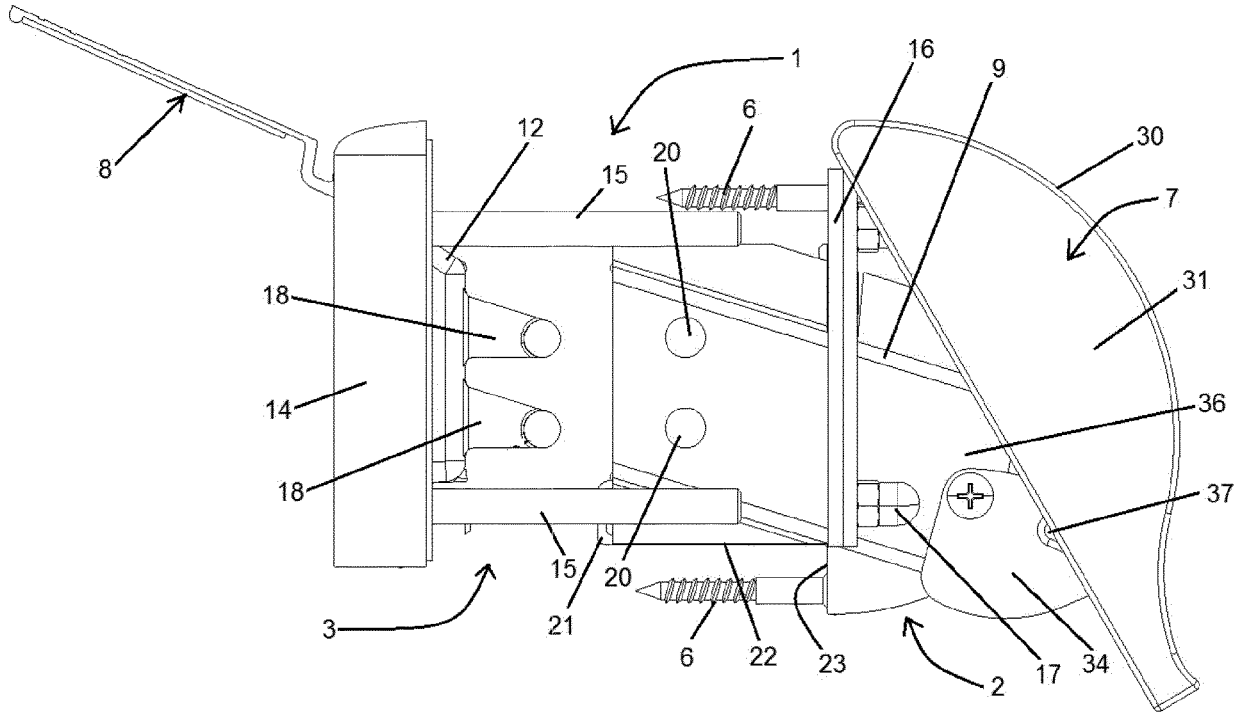
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Fig. 2

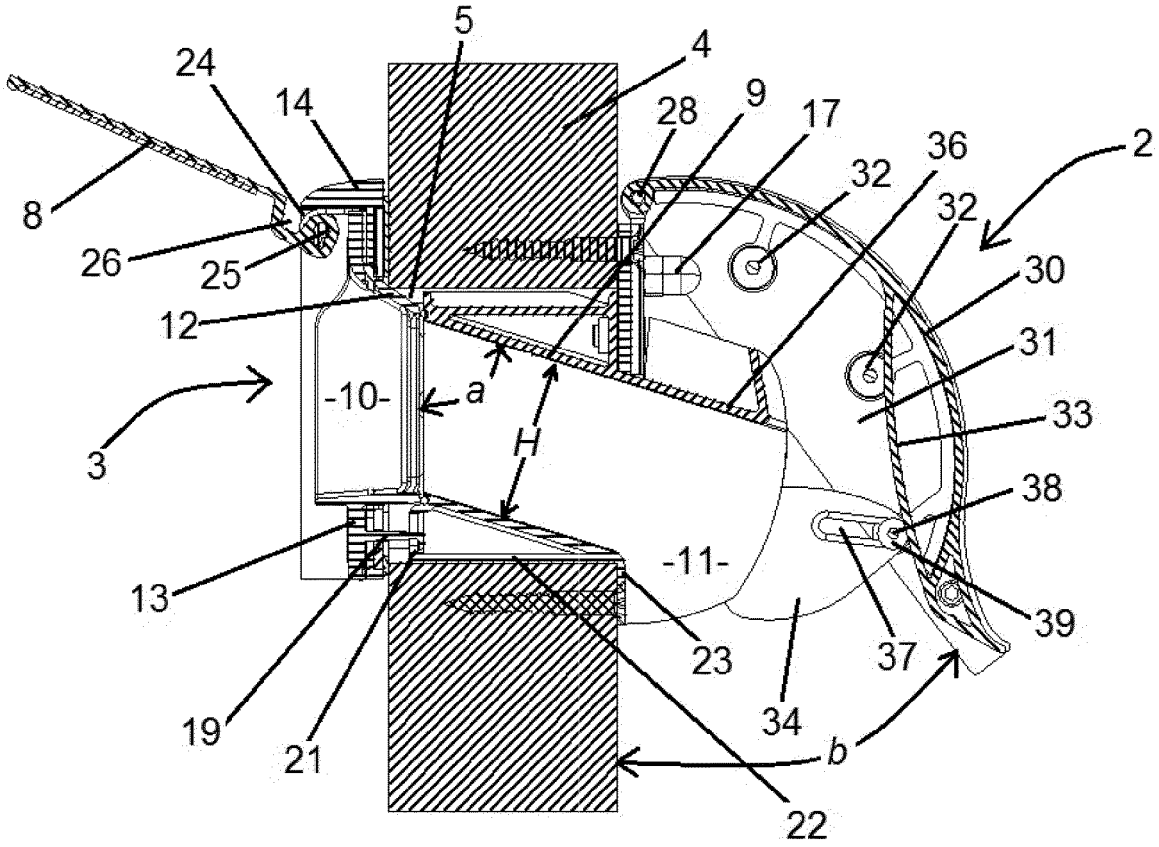
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Fig. 3

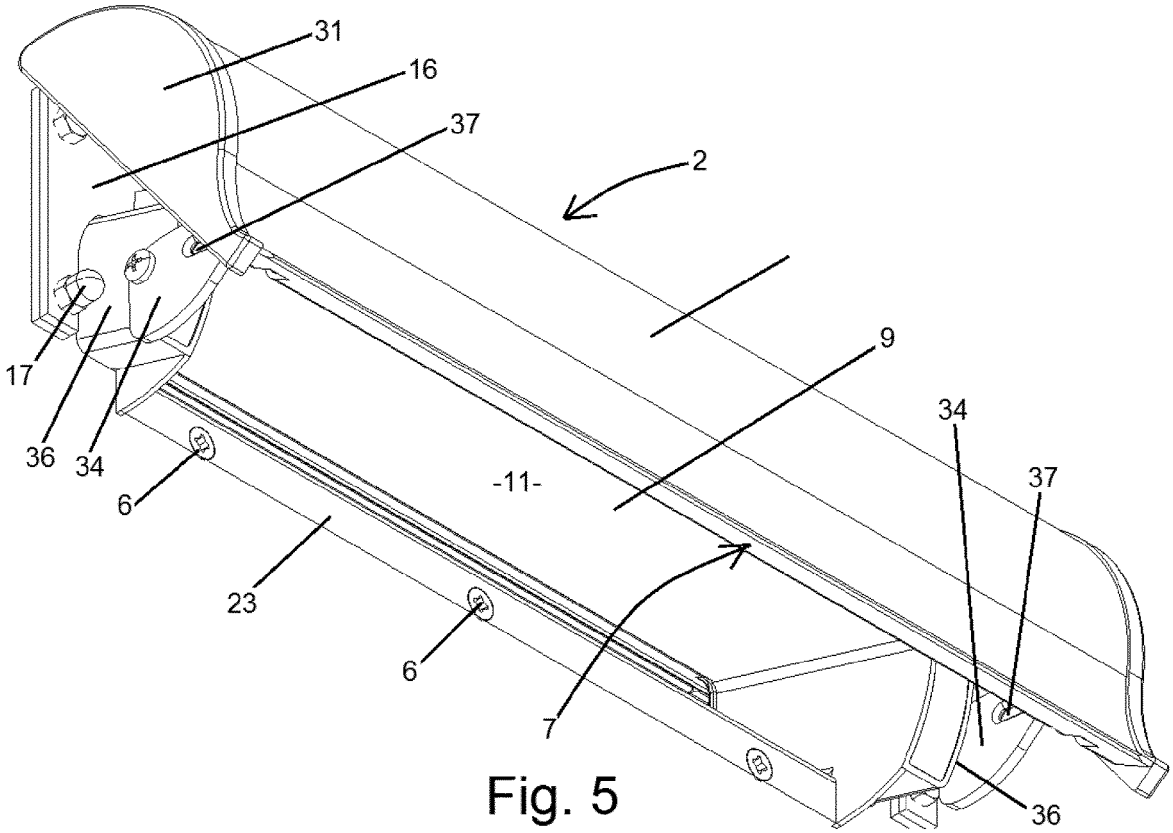
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Fig. 5

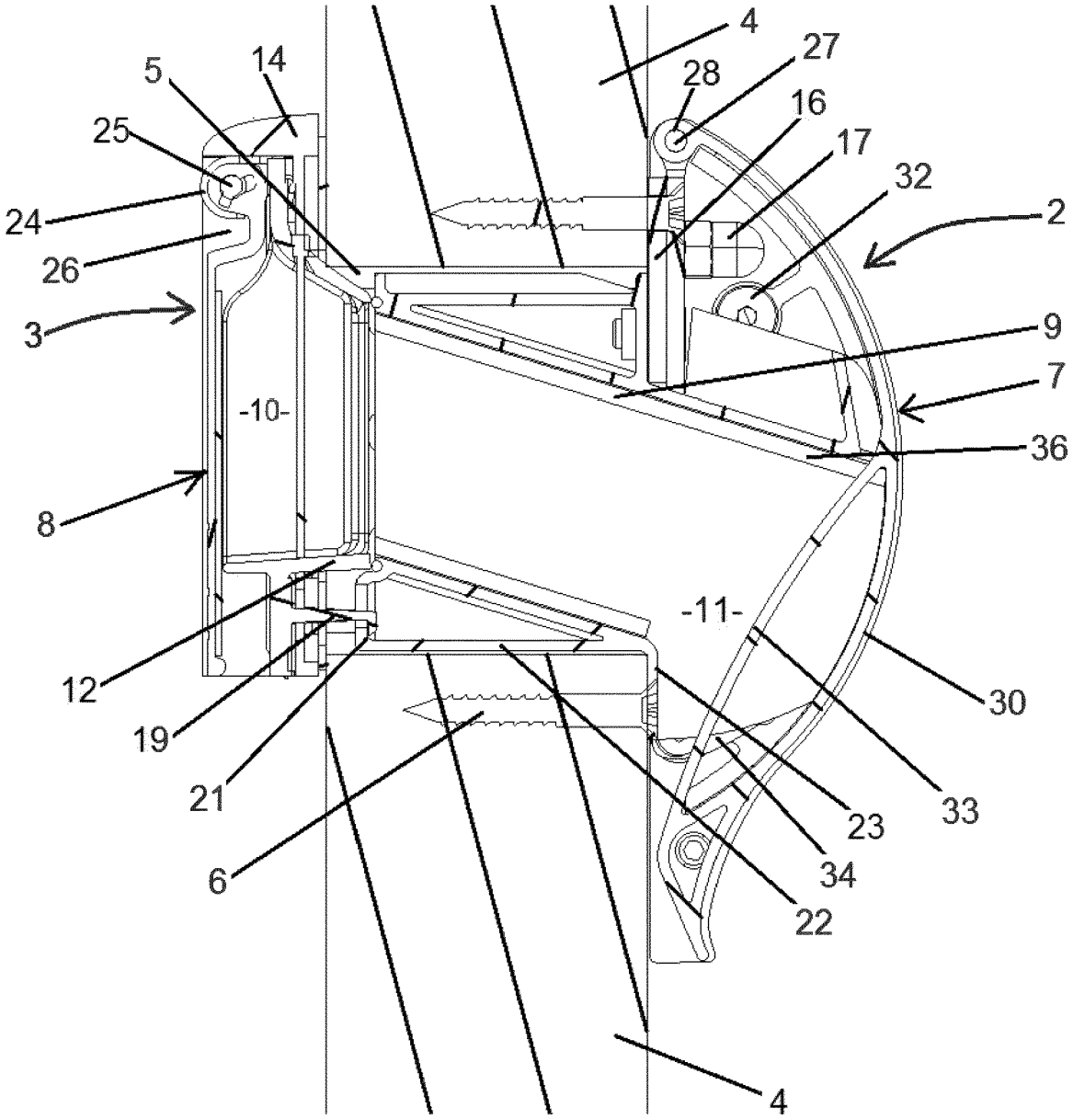

Fig. 4

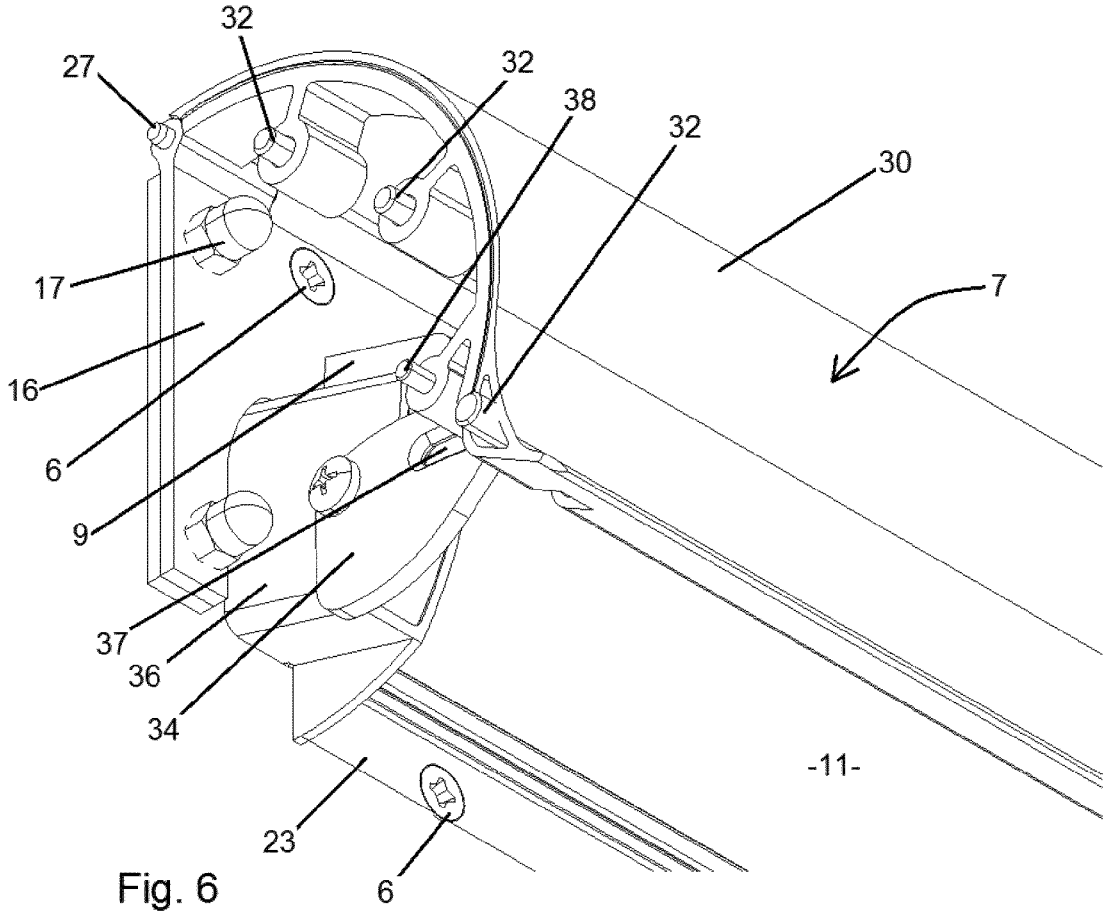
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Fig. 6

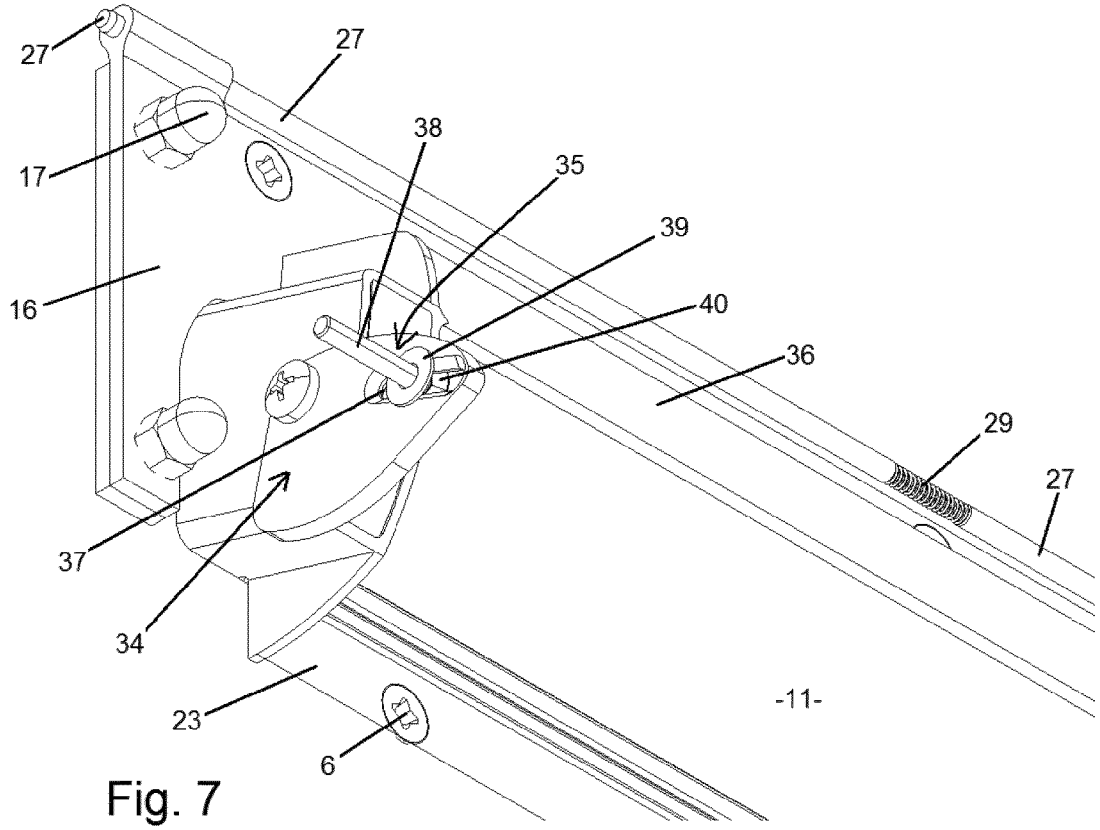
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Fig. 7

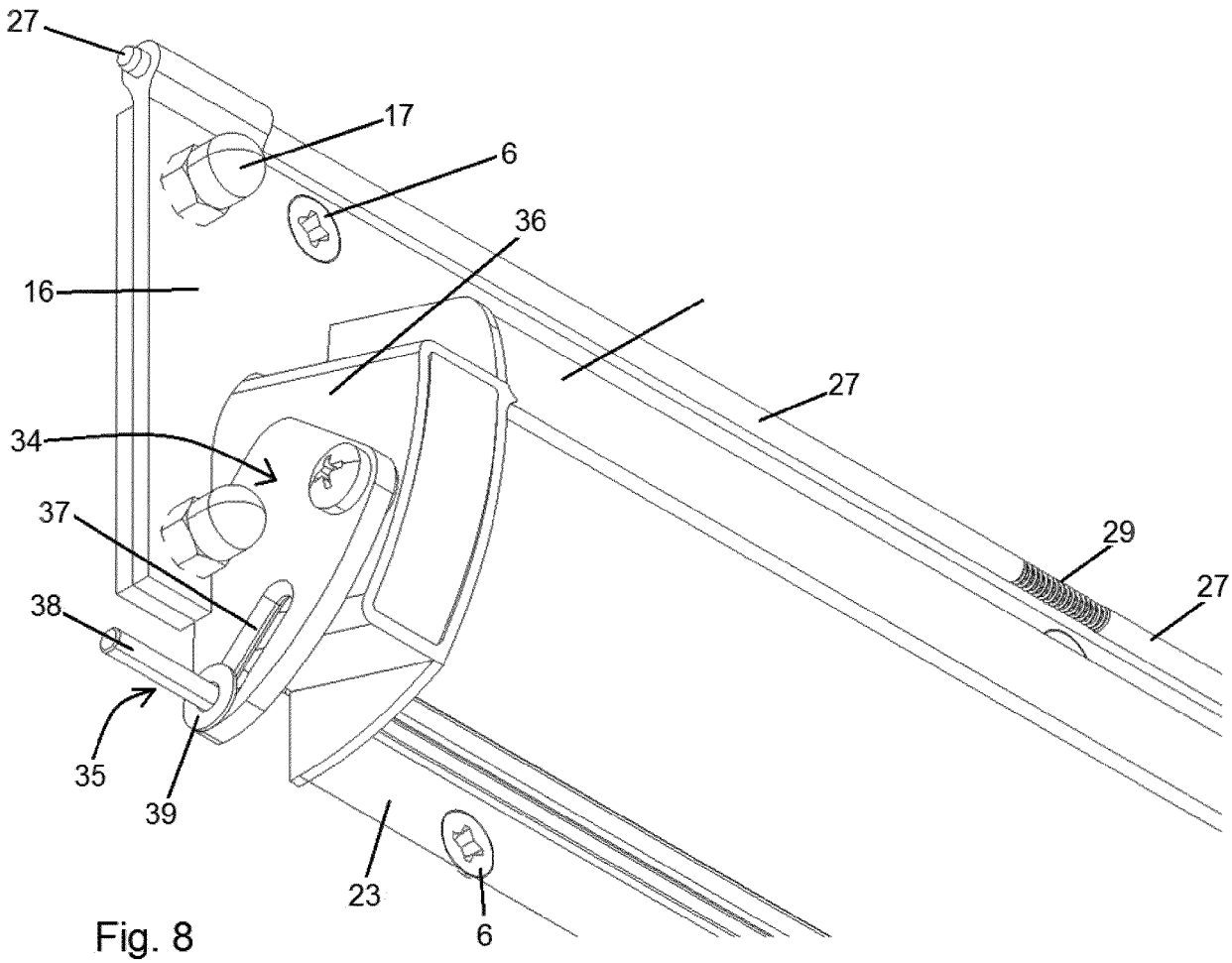

Fig. 8

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EUROPEAN SEARCH REPORT

Application Number
EP 23 15 3799

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Place of search	Date of completion of the search	Examiner
The Hague	24 April 2023	Longo dit Operti, T

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