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(54) **REINFORCED DOOR**

(57) A reinforced door (1), comprising a walled-in frame (2) intended for stable fixing in the respective installation wall opening (A), a frame (3) that can be coupled rigidly to the walled-in frame (2), and a leaf (4) that is pivoted to the frame (3) for the closure/opening of the installation opening. The leaf (4) comprises an internal reinforcement frame (5) that is substantially tub-shaped and is provided with stiffening ribs (7) and with at least one internal anchoring block (8) for an arm (9) of a part (10) of a respective hinge (11).

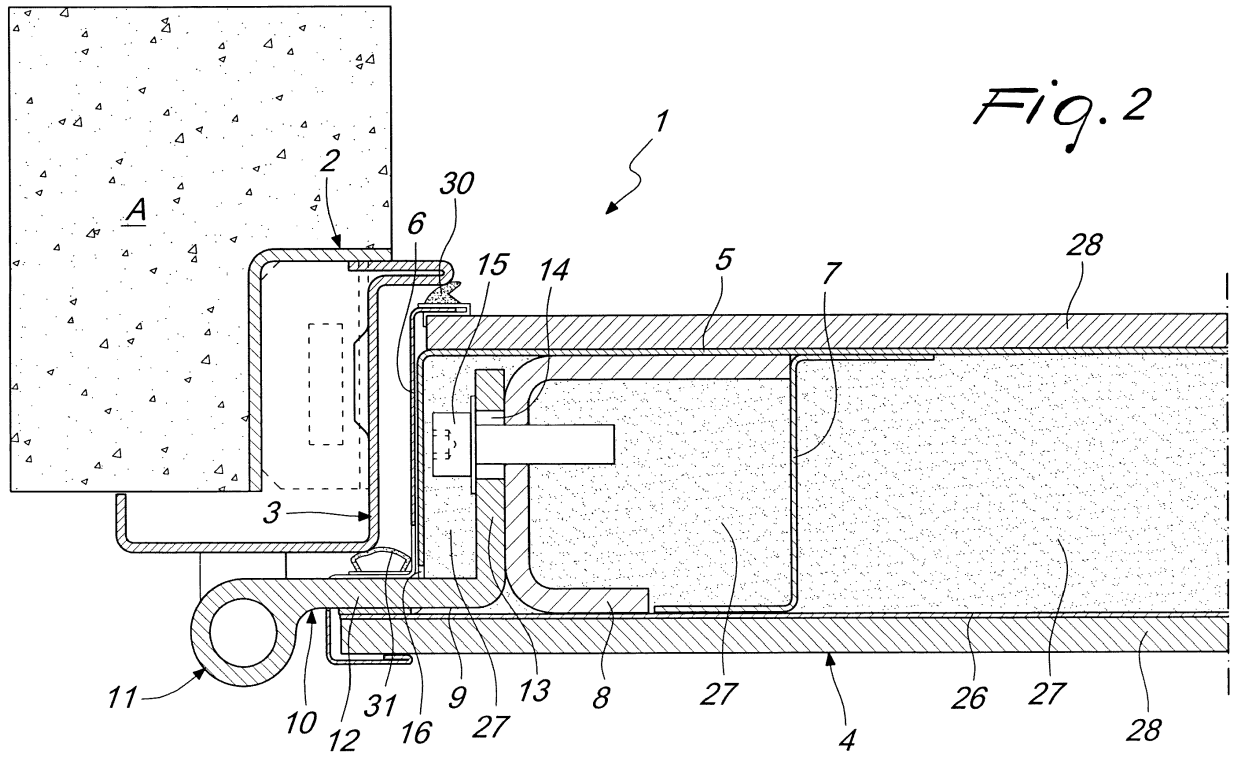

Fig. 2

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Description

[0001] The present invention relates to a reinforced door.

[0002] A reinforced door (or intrusion-resistant door) is a specific closure element, intended for installation in an opening for access to an enclosed space (a home, an office or others), that has specific security characteristics against break-ins. Hereinafter, the expression "reinforced door" actually will designate all doors that have high security standards against break-in intrusion, such as for example armored doors, intrusion-resistant doors, security doors and other equivalent devices.

[0003] The performance of a reinforced door regarding break-ins is ensured by the lock that is mounted on the door proper (since it might be possible to open the door by picking the lock) and by the actual structure of the door and of its frame.

[0004] The door in fact comprises adapted bolts intended (in the closed configuration) to engage in respective seats of the frame in a stable manner and also comprises various reinforcement elements inside it, intended to increase its mechanical strength and stiffness.

[0005] Among the weak points, as regards the mechanical performance required to avoid break-ins, it is necessary to mention the hinges.

[0006] These components in fact must have a structure and dimensions that are suitable to bear the weight of the door in a cantilever arrangement (in some cases even far more than one hundred kilograms) and to withstand mechanical stresses related to break-ins, such as for example the action of a crowbar or other break-in lever (applying static or dynamic pressures).

[0007] It is therefore necessary to adopt for these components particular dimensions which ensure their necessary rigidity and mechanical strength.

[0008] At the same time, it is also necessary to be able to adjust the position of the door with respect to the frame (during its installation) in order to ensure all the necessary alignments that ensure effective and safe closure. All these adjustments are performed usually on the hinges.

[0009] Reconciling the extreme mechanical strength that is required of these components with the possibility to adjust precisely the position of the leaf with respect to the frame is the main limitation that affects hinges of the known type.

[0010] A particularly strong and sturdy hinge does not have many adjustments and therefore requires the frame to be installed substantially perfectly in order to ensure good operation of the reinforced door.

[0011] A hinge provided with many adjustments, instead, is particularly suitable to tolerate imprecisions in the mounting of the frame on the installation opening (since said imprecisions can be corrected by adjusting the hinges themselves). However, said hinge is less resistant from a mechanical standpoint and therefore is more easily subject to break-in.

[0012] Another problem that affects reinforced doors of the known type is linked to the need to perform considerable masonry work in order to allow replacement of a traditional door with a reinforced door.

[0013] This problem is felt strongly by installation technicians, who therefore prefer mounting doors directly at a building site rather than performing complicated replacements of existing doors.

[0014] A further problem shared by all reinforced doors is linked to thermal and acoustic performance: a closure element must in fact ensure thermal and acoustic insulation with respect to the outside environment (so-called ABC insulation, i.e., insulation aimed at preventing infiltrations of air, water and wind).

[0015] This performance is referenced in many applicable statutory provisions (at the European and international level) that define thermal and acoustic insulation standards for reinforced doors.

[0016] Traditional doors comprise gaskets, chambers filled with rock wool (and the like) and internal panels made of insulating material in order to achieve this goal.

[0017] Arranging these elements, however, is insufficient to avoid the presence of thermal bridges (a limited local region of the building enclosure that has a higher heat flow density than the adjacent constructive elements) and/or the transmission of sound waves.

[0018] In particular, the products marketed by the company Metalnova under the trade names TR91 and IT91 (and others equivalent thereto) are known in the field of reinforced doors.

[0019] These doors have a very deep walled-in frame, which therefore requires a large recess in the installation opening.

[0020] It is evident that a walled-in frame of this type does not lend itself to being installed easily in the wall opening in which a traditional door was installed: the Metalnova doors known as TR91 and IT91 (and others equivalent thereto), therefore, are not suitable to replace easily doors of the traditional type and therefore require important masonry work to adapt the wall opening.

[0021] Metalnova doors known as TR91 and IT91 (and others equivalent thereto) comprise a frame constituted by contoured profiles: at an end edge of one of the faces of these profiles there is a protruding contoured portion that has a substantially square cross-section obtained by bending the metal plate that constitutes the profiles.

[0022] The contoured portion has a depth of approximately 15 mm and therefore also entails a considerable depth of the installation wall space in order to allow its accommodation.

[0023] The contoured portion defines the abutment against which the leaf rests upon closure.

[0024] As shown, the frame, also, has constructive and dimensional solutions that make it unsuitable to be installed in wall openings that previously accommodated traditional doors, making it instead necessary to perform masonry work on the installation opening in order to allow its accommodation.

[0025] The leaf of Metalnova doors known as TR91

and IT91 (and others equivalent thereto), moreover, is constituted by an internal reinforcement frame that is tub-shaped and on which reinforcement slats having an omega-like contour are installed. The slats alone have the task of stiffening the internal reinforcement frame: for this reason it is necessary to resort to particularly high metal plate thicknesses in order to provide the internal reinforcement frame (the thickness of the metal plate used by Metalnova for these doors is 15/10 of a millimeter).

[0026] The weight increase of the leaf produced by this dimensional choice (high plate thickness) in any case does not lead to a sufficient rigidity of the leaf, since it is ensured exclusively by the lateral edges of the reinforcement frame and by the presence of the stiffening slats.

[0027] The large weight of the leaf of Metalnova doors known as TR91 and IT91 (and others equivalent thereto) requires the adoption of particularly simple and strong hinges.

[0028] The hinge parts of the leaf comprise a flat arm, which is intended to be coupled to a tubular fixing element that will be welded to the internal reinforcement frame at a lateral edge thereof.

[0029] This constructive choice, aimed mainly at the stiffness of the node for articulation of the leaf to the frame (due to a large extent to the great weight of the leaf caused by the high thicknesses required due to the particular constructive architecture that has been selected), does not allow easy adjustment of the hinge and therefore entails considerable complication during installation of the reinforced door in the wall opening.

[0030] The aim of the present invention is to solve the problems described above, by devising a reinforced door that ensures optimum resistance against break-ins.

[0031] Within this aim, an object of the invention is to devise a reinforced door the adjustable hinges of which have a high mechanical strength.

[0032] Another object of the invention is to devise a reinforced door that can be installed easily even if it replaces a traditional door.

[0033] Another object of the invention is to devise a reinforced door that has good thermal and acoustic insulation performance.

[0034] Another object of the present invention is to provide a reinforced door that has low costs, is relatively simple to provide in practice and is safe in application.

[0035] This aim and these and other objects are achieved by a reinforced door of the type comprising a walled-in frame intended for stable fixing in the respective installation wall opening, a frame that can be coupled rigidly to said walled-in frame, and a leaf that is pivoted to said frame for the closure/opening of the installation opening, characterized in that said leaf comprises an internal reinforcement frame that is substantially tub-shaped and is provided with stiffening ribs and with at least one internal anchoring block for an arm of a part of a respective hinge.

[0036] Further characteristics and advantages of the invention will become better apparent from the description of a preferred but not exclusive embodiment of the reinforced door according to the invention, illustrated by way of non-limiting example in the accompanying drawings, wherein:

Figure 1 is a sectional view, taken along a perpendicular transverse plane, of a reinforced door according to the invention;

Figure 2 is a sectional view, taken along a perpendicular transverse plane, of a further version of a reinforced door according to the invention;

Figure 3 is a partially sectional perspective view of the leaf of a reinforced door according to the invention;

Figure 4 is a perspective view of the walled-in frame of a reinforced door according to the invention;

Figure 5 is a perspective view of the frame of a reinforced door according to the invention;

Figure 6 is a sectional view, taken along a perpendicular transverse plane, of the frame of a reinforced door according to the invention;

Figure 7 is a sectional view, taken along a perpendicular transverse plane, of the leaf of a reinforced door according to the invention;

Figure 8 is a sectional view, taken along a horizontal transverse plane, of a frame portion to which a hinge part of a particular constructive solution of a reinforced door according to the invention is coupled;

Figure 9 is a rear view of the frame portion of Figure 8;

Figure 10 is a sectional side view, taken along a vertical plane, of the frame portion of Figure 8;

Figure 11 is a sectional view, taken along a perpendicular transverse plane, of a conventional reinforced door known as TR91 or IT91 (or other door equivalent thereto), manufactured and marketed by the company Metalnova.

[0037] With reference to the figures, the reference numeral 1 generally designates a reinforced door.

[0038] The reinforced door 1 comprises a walled-in frame 2 intended for stable fixing in the respective installation wall opening A, a frame 3 that can be coupled rigidly to the walled-in frame 2, and a leaf 4 that is pivoted to the frame 3 for the closure/opening of the installation opening.

[0039] According to the invention, the leaf 4 comprises an internal reinforcement frame 5 that is substantially tub-shaped.

[0040] The reinforcement frame 5, being made of metal plate, has a very limited stiffness (especially flexural and torsional stiffness), since only its perimetric edges 6 contribute to structural stiffening.

[0041] For this reason, the reinforcement frame 5 is provided with stiffening ribs 7.

[0042] It should also be specified that the reinforcement frame 5 further comprises at least one anchoring block 8, which is coupled inside it: the block 8 indeed acts as anchoring for an arm 9 of a part 10 of a respective

hinge 11.

[0043] It is deemed important to point out that with particular reference to a constructive solution of unquestionable interest in application, the arm 9 of the part 10 of the hinge 11 comprises a first portion 12 that is parallel to the plane of arrangement of the leaf 4 and a second portion 13 that is perpendicular to the first portion 12.

[0044] The second portion 13 is the one that can be coupled to the anchoring block 8.

[0045] It is important to point out that at least one component selected between the anchoring block 8 and the second portion 13 of the arm 9 comprises at least one slot 14.

[0046] The presence of the slot 14 allows to adjust the position of the hinge part 10 with respect to the anchoring block 8 along the direction of said slot 14, giving an optimum possibility to adjust the arrangement of the leaf 4 with respect to the frame 3: this adjustment possibility is particularly useful and interesting for installation technicians, who can thus compensate for any irregularities in the mounting and/or installation of the walled-in frame 2 and of the frame 3 in the wall opening A.

[0047] It is specified that at least one anchoring screw 15 is preset for the adjustable coupling of the position of the second portion 13 of the arm 9 with respect to the block 8: the screw 15 is accommodated in the at least one slot 14.

[0048] According to the particular constructive solution shown in the accompanying figures, the slot 14 is provided in the second portion 13 of the arm 9, while the anchoring block 8 comprises a threaded hole within which the screw 15 can engage in order to ensure the fastening of the arm 9 (in compliance with the alignment decided by the installation technician) on the block 8.

[0049] The reinforcement frame 5 comprises, along one of its edges 6, at the positions where the hinge parts 10 will be located, at least one recess 16 for accommodating the first portion 12 of the part 10 of the hinge 11.

[0050] The recess 16 is deeper than the thickness of the first portion 12 of the arm 9, allowing movements of the hinge part 10 produced by the adjustment of the position of the second portion 13 with respect to the block 8 within the stroke defined by the slot 14.

[0051] It is specified that along the perimetric edges 6 of the reinforcement frame 5, at the recesses 16, there are also openings (not visible in the accompanying drawings) intended to allow the passage of a tool (for example a screwdriver, a contoured head key, and the like) with which to actuate rotationally the screw 15 and thus fasten the second portion 13 of the arm 9 on the anchoring block 8 (in compliance with the requirements of arrangement of the hinge part 10 in order to allow optimum alignments and perfect closure of the leaf 4 on the frame 3).

[0052] Furthermore, it is deemed appropriate to point out that the walled-in frame 2 comprises at least three angular profiles 17 and 18: two profiles 17 are vertical and one profile 18 is coupled horizontally to the tops of the two vertical profiles 17.

[0053] In order to allow correct installation of the walled-in frame 2 in the wall opening A, template elements 19 are adopted which have the purpose of keeping the correct alignment (parallel and perpendicular arrangement) of the profiles 17 and 18. Once the concrete or cement paste with which the frame 2 has been coupled to the wall opening A, it is possible to remove the template elements 19 to then associate the frame 3 with the walled-in frame 2.

[0054] Furthermore, it is specified that the angular profiles 17 and 18 that constitute the walled-in frame 2 comprise reinforcement brackets which are distributed along the longitudinal direction at right angles thereto and are welded and intended to stiffen each individual profile 17 and 18.

[0055] According to a specific embodiment, the frame 3 can comprise advantageously at least three contoured profiles 20 and 21.

[0056] At least the two vertical profiles 20 comprise, in this case, on a first edge 22, a stiffening border 23 constituted by a lateral flap that is folded onto itself and protrudes from a first face with which it is associated and, on a second edge 24, a band 25 that is folded at right angles with respect to a second face with which it is associated: the first face is perpendicular to the second face so as to constitute the edge 22 and the edge 24, which are mutually incident, forming a right angle.

[0057] According to a particular embodiment, it is specified that the horizontal profile 21 of the frame 3, which is coupled to the tops of the two vertical profiles 20, also can comprise conveniently, on a first edge, a stiffening border that is constituted by a lateral flap that is folded onto itself and protrudes from a first face with which it is associated and, on a second edge, a band that is folded at right angles with respect to a first face with which it is associated: in this case also, the first face is perpendicular to the second face.

[0058] An embodiment that has optimum mechanical resistance to break-ins has stiffening ribs 7 that have a substantially Z-shaped cross-section: each rib 7 is therefore coupled rigidly and nondetachably to the bottom of the substantially tub-shaped internal reinforcement frame 5.

[0059] More specifically, it is noted that the stiffening ribs 7 can be arranged along three distinct longitudinal axes which are substantially vertical with respect to the installation arrangement of the leaf 4, and according to three distinct transverse axes, which are substantially horizontal with respect to the installation arrangement of the leaf 4.

[0060] The substantially tub-shaped internal reinforcement frame 5 positively comprises a closure lamina 26, which constitutes an actual nonremovable lid for it. The lamina 26 is welded to the edges of the reinforcement frame 5 and to the top of the reinforcement ribs 7 (which, by having a Z-shaped contour, can have an end face that is welded to the bottom of the reinforcement frame and the opposite face that is welded to the closure lamina 26,

with a consequent great increase in the stiffness of the leaf 4 thus constituted).

[0061] Finally, it is necessary to point out that the gaps that are present between the substantially tub-shaped internal reinforcement frame 5 and the covering lamina 26 accommodate thermal and acoustic insulation material 27.

[0062] The leaf 4 differs from the many conventional solutions in relation to the use of the double metal plate (one metal plate is used to provide the reinforcement frame 5 and one metal plate is used to provide the covering lamina 26). This use is an optimum solution for creating structural rigidity, further ensuring perfect conditions of parallel and perpendicular arrangement of the various parts thereof (the use of a single metal plate that is widespread in reinforced doors of the known type entails a considerable increase in the thickness thereof, often causing alignment problems due to the warping of the metal sheets during the welding process).

[0063] The assembly constituted by the reinforcement frame 5 and by the covering lamina 26 is further consolidated by the presence of the stiffening ribs 7, the particular configuration with a Z-shaped contour of which allows to weld the two end faces one on the bottom of the reinforcement frame 5 and one on the covering lamina 22.

[0064] According to a particularly efficient embodiment with excellent behavior regarding break-ins, the stiffening ribs 7 can be three arranged vertically and six arranged horizontally, creating a lightweight but very effective stiffening lattice.

[0065] The total thickness of the leaf 4 (excluding the covering panels 28, which depending on the aesthetic requirements can be made of wood, polymeric, composite, ceramic, metallic, made of fabric, made of leather or constituted by combinations of these materials with each other or with others not listed here) can be comprised between 55 mm and 56 mm.

[0066] Internally, the leaf 4 is insulated with insulating material 27 that can vary according to the acoustic and thermal performance to be obtained.

[0067] The actual particularity resides in the hinge 11, which is fixed by means of screws 15 to the anchoring block 8 that acts as a fixed support, allowing (by means of the slot 14 provided in the second portion 13 of the arm 9) simple and easy depth adjustment.

[0068] The shape of the part 10 of the hinge 11 is not of a commercial type and has been studied and designed specifically in order to make the door 1 according to the invention simple and straightforward to install.

[0069] The height adjustment of the leaf 4 with respect to the frame 3 (which completes the adjustment on three axes provided for reinforced doors) is performed by means of a threaded grub screw arranged inside the hinge 11.

[0070] The walled-in frame is provided by means of L-shaped angular profiles 17 and 18, which are provided by means of press-bending processes: according to a specific constructive solution, the profiles 17 and 18 can have a cross-section measuring 30 x 50 mm, conveniently stiffened by ridges (the welded brackets described earlier). This greatly reduced space occupation ensures installation even as a replacement of "internal" doors having a wooden structure.

[0071] The frame 3 has a first flattened fold (the stiffening border 23), useful to reduce the size and stiffen the articulation node (which comprises the hinge 11). Esthetically, furthermore, on the outer side one sees a very low metal plate thickness, approximately 4 mm, which makes the appearance of the reinforced door 1 more pleasant with respect to conventional doors.

[0072] The frame 3 is built by welding and painted. This process, also, constitutes a value element for the reinforced door 1 according to the invention, making it strong and uniformly finished (without any L-shaped elements).

[0073] The parts 29 of the hinges 11 of the frame 3 have a total depth of 27.5 mm, with the possibility of horizontal adjustment by means of the slot 14 of the arm 9 of the hinge 10 and the recess 16 of the frame 3.

[0074] The choice of this depth measurement is dictated by the need to mount standardized hinge covers of the commercial type.

[0075] From a constructive point of view, it is specified that it is not possible to provide different depth measurements, which differ too much from the one adopted, indeed because respective components for completing the reinforced door (hinge cover, hinge pins and gaskets) would not exist on the market.

[0076] The reinforced door 1 comprises double gaskets.

[0077] The first gasket 30 is mounted directly on the frame 3 and has a commercial profile: its coupling is achieved preferably by using a self-drilling locking screw. This procedure ensures the permanent tightness thereof (which would not be ensured by adopting an adhesive gasket).

[0078] According to a preferred constructive solution, the first gasket 30 is mounted in an interlocking manner between the perimetric edges 6 and the external covering panel 28: in this case the gasket 30 can have conveniently a commercial profile.

[0079] The second gasket 31 is instead mounted directly on the contact surface of the leaf 4: in this case an adhesive gasket is used, since it is believed that the inner side of the door 1 is less subject to deterioration of the adhesives than the outer side.

[0080] Furthermore, the reduced thicknesses (for example, the second gasket can have a cross-section of 3 x 15 mm) force the adoption of this solution.

[0081] A lock with three bolts plus a spring latch, fixed to the reinforcement frame 5 by means of specific supports (which in turn are welded to the reinforcement frame 5) is used preferably for the reinforced door 1. The upper and lower rod and redirection element assemblies are connected to the lock and are both welded manually.

[0082] Moreover, commercial bolts are used which are fixed by means of an internal nut to the leaf 4, ensuring

a good assembly speed and at the same time good resistance performance against stripping break-in attempts (performed with crowbars and other similar tools).

[0083] The reinforced door 1 is conceived as a new type of reinforced door that differs in its structural characteristics from all other commercially available ones, while maintaining the indispensable structural aspects that are required to comply effectively with the provisions of the standards currently in force.

[0084] The reinforced door 1 is also aimed at a market seeking to replace an old existing closure element; a fundamental parameter during design was the provision of a node (understood as the assembly of the walled-in frame 2, the frame 3, the leaf 4 and the hinge 11) that is extremely small in terms of space occupation and dimensions, so as to not intervene with difficult and often imprecise masonry work but just by removing the old wood casing that is present in the installation opening, without even having to perform additional covering and cladding work during installation.

[0085] Conveniently, the present invention solves the problems described earlier, providing a reinforced door 1 that ensures optimum resistance against break-ins.

[0086] This is achieved by means of a structure that is constituted by metal plates of low thickness that are conveniently stiffened and reinforced with stiffening ribs 7 and by adopting a coupling between the frame 5 and the closure lamina 26 so as to constitute a hollow box-like body.

[0087] Advantageously, the reinforced door 1 has hinges 11 that are adjustable but are shaped so as to have maximum mechanical strength (even greater than that of commercially available hinges).

[0088] Positively, the reinforced door 1 can be installed easily, even if it replaces a traditional door, because the reduced space occupation of the walled-in frame 2 and of the frame 3 allow to fix it in seats (wall openings A) that are much smaller than those needed for other traditional reinforced doors.

[0089] Conveniently, the reinforced door 1 according to the invention has good thermal and acoustic performance thanks to the presence of the insulating material 27.

[0090] Usefully, the reinforced door 1 according to the invention overcomes all the typical problems of door models IT91 and TR91 manufactured and marketed by Metalnova:

- the door 1 has a walled-in frame 2 that is shallow and can therefore be installed in small wall openings A (for example ones that previously accommodated a traditional non-reinforced door);
- the door 1 comprises a frame 3 provided with a stiffening border 23 constituted by a lateral flap that is folded onto itself and protrudes from a first face with which it is associated, the depth of the stiffening border 23 is equal to twice the thickness of the metal plate that constitutes it and therefore its space occupation is minimal. The border can thus form an abutment surface for the leaf 4 upon closure, ensuring sufficient rigidity without requiring great depths of the installation wall opening A;
- the door 1 comprises a leaf 4 that is very stiff thanks to the presence of stiffening ribs 7 that are distributed along its internal reinforcement frame 5 and of a covering lamina 26 that closes the reinforcement frame 5, defining a box-like body that is compact and scarcely subject to flexing and torsion. This solution allows to use a metal plate with a thickness of 12/10 of a mm to provide the reinforcement frame 5 and a metal plate with a thickness of 10/10 of a mm to provide the covering lamina 26; this ensures extremely high overall stiffness even though the thicknesses are minimal and allows to use stiffening ribs 7 of a similar thickness which are Z-shaped (omega-shaped slats, as in Metalnova doors, which would increase excessively the weight of the leaf, are not necessary).

[0091] Effectively, the reinforced door 1 can be manufactured with low costs and is further relatively simple to provide in practice: these characteristics ensure its safe application.

[0092] The invention thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the accompanying claims; all the details may further be replaced with other technically equivalent elements.

[0093] With particular reference to the constructive solution shown in the accompanying Figures 8, 9 and 10, it is noted that the hinge part 11 of the hinge 10 can be fixed to the frame 3 by using adjustable anchoring means.

[0094] More specifically, a constructive solution is shown in which the frame 3 comprises slots 32 that are intended to accommodate the screws 33 for fixing the hinge part 11.

[0095] In the internal part of the frame 3 (i.e., the one directed toward the wall opening A) that faces the slots 32 there is a movable block 34 provided with two threaded seats whose shape and dimensions are complementary to those of the screws 33.

[0096] The threaded seats of the block 34 can accommodate the screws 33, allowing, upon tightening of the screws 33 in the respective seats, the locking of the hinge part 11 on the frame 3.

[0097] The block 34 also comprises a threaded transverse through hole, which is perpendicular to the plane that contains the axes of the threaded seats described previously (and intended to accommodate the screws 33).

[0098] A grub screw 35 can be inserted by screwing into the transverse hole of the block 34.

[0099] Following screwing and unscrewing of the grub screw 35 in the transverse hole it is possible to translate the block 34, with consequent displacement of the hinge part 11 that is integral therewith (according to a stroke defined by the length of the slots 32).

[0100] Thanks to this constructive solution it is therefore possible to move the hinge parts 11 backward and forward, allowing a simple adjustment, which is very useful during mounting of the door 1 and/or during maintenance thereof.

[0101] In the exemplary embodiments shown, individual characteristics, given in relation to specific examples, may actually be interchanged with other different characteristics that exist in other exemplary embodiments.

[0102] In practice, the materials used, as well as the dimensions, may be any according to requirements and to the state of the art.

[0103] 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 reinforced door, of the type comprising a walled-in frame (2) intended for stable fixing in the respective installation wall opening (A), a frame (3) that can be coupled rigidly to said walled-in frame (2), and a leaf (4) that is pivoted to said frame (3) for the closure/opening of the installation opening, **characterized in that** said leaf (4) comprises an internal reinforcement frame (5) that is substantially tub-shaped arid is provided with stiffening ribs (7) and with at least one internal anchoring block (8) for an arm (9) of a part (10) of a respective hinge (11).

2. The reinforced door according to claim 1, **characterized in that** said arm (9) of said part (10) of said hinge (11) comprises a first portion (12) that is parallel to the plane of arrangement of said leaf (4) and a second portion (13) that is perpendicular to the first portion (12), said second portion (13) being rigidly associable with said anchoring block (8).

3. The reinforced door according to claim 2, **characterized in that** at least one component selected between said anchoring block (8) and said second portion (13) of said arm (9) comprises at least one slot (14), at least one anchoring screw (15) being intended for the adjustable coupling of said second portion (13) of said arm (9) to said block (8) and being accommodated in said at least one slot (14).

4. The reinforced door according to claim 3, **characterized in that** the edge (6) of said reinforcement frame (5) comprises at least one recess (16) for accommodating the first portion (12) of said part (10) of said hinge (11), said recess (16) being deeper than the thickness of said first portion (12), allowing displacements of said hinge part (10) that are a consequence of the adjustment of the position of said second portion (13) with respect to said block (8) within the stroke defined by said at least one slot (14).

5. The reinforced door according to claim 1, **characterized in that** said walled-in frame (2) comprises at least three angular profiles (17, 18), two profiles (17) being vertical and one profile (18) being coupled horizontally to the tops of said two vertical profiles (17).

6. The reinforced door according to one or more of the preceding claims, **characterized in that** said angular profiles (17, 18) comprise, distributed along their longitudinal direction at right angles thereto, welded reinforcement brackets intended to stiffen each individual profile (17, 18).

7. The reinforced door according to claim 1, **characterized in that** said frame (3) comprises at least three contoured profiles (20, 21), at least the two vertical profiles (20) comprising, on a first edge (22), a stiffening border (23) constituted by a lateral flap that is folded onto itself and protrudes from a first face with which it is associated and, on a second edge (24), a band (25) that is folded at right angles with respect to a first face with which it is associated, said first face being perpendicular to said second face.

8. The reinforced door according to one or more of the preceding claims, **characterized in that** the horizontal profile (21) coupled to the tops of said two vertical profiles (20) also comprises, on a first edge, a stiffening border constituted by a lateral flap that is folded onto itself and protrudes from a first face with which it is associated and, on a second edge, a band that is folded at right angles with respect to a first face with which it is associated, said first face being perpendicular to said second face.

9. The reinforced door according to one or more of the preceding claims, **characterized in that** said stiffening ribs (7) have a substantially Z-shaped cross-section, each rib (7) being coupled rigidly and non-detachably to the bottom of said substantially tub-shaped internal reinforcement frame (5).

10. The reinforced door according to one or more of the preceding claims, **characterized in that** said stiffening ribs (7) are arranged along three distinct longitudinal axes which are substantially vertical with respect to the installation arrangement of said leaf (4) and along three distinct transverse axes which are substantially horizontal with respect to the installation arrangement of said leaf (4).

11. The reinforced door according to one or more of the preceding claims, **characterized in that** said substantially tub-shaped internal reinforcement frame (5) comprises a closure lamina (26), which constitutes a true nonremovable lid for it, said lamina (26) being welded to the edges (6) of said tub-shaped reinforcement frame (5) and to the top of said reinforcement ribs (7).

12. The reinforced door according to one or more of the preceding claims, **characterized in that** the gaps that are present between said substantially tub-shaped internal reinforcement frame (5) and said covering lamina (26) accommodate thermal and acoustic insulation material (27).

Fig. 1

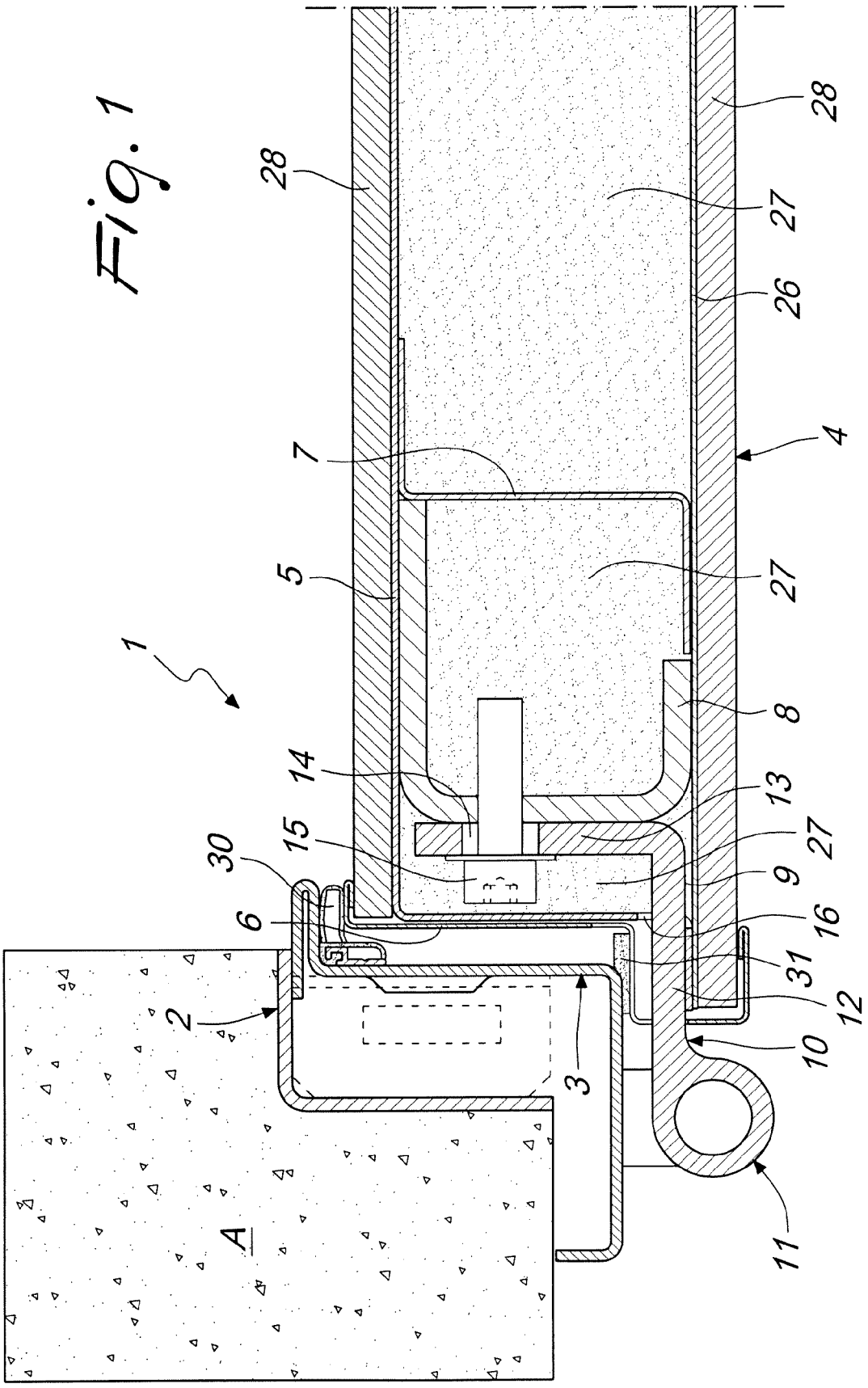
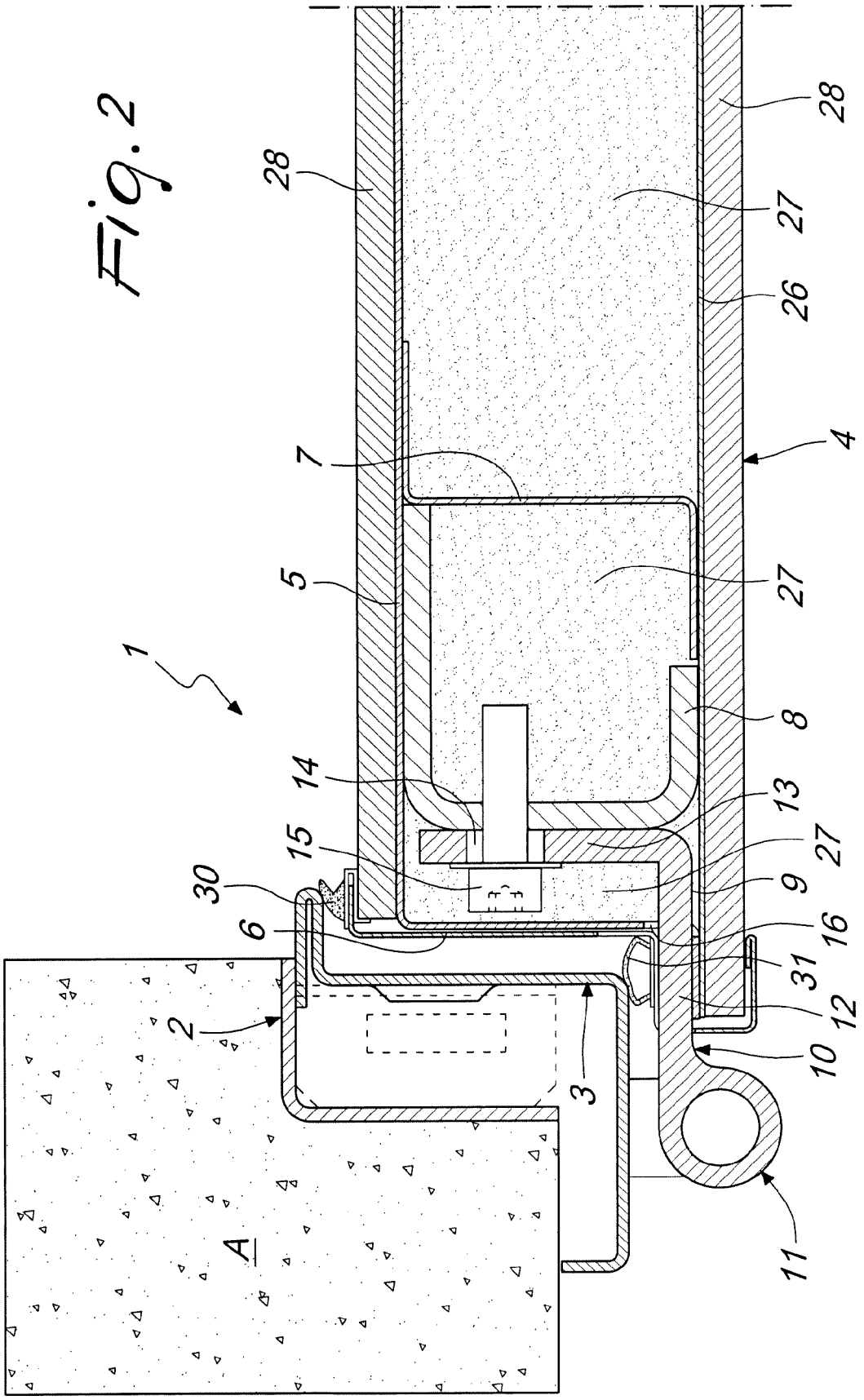


Fig. 2



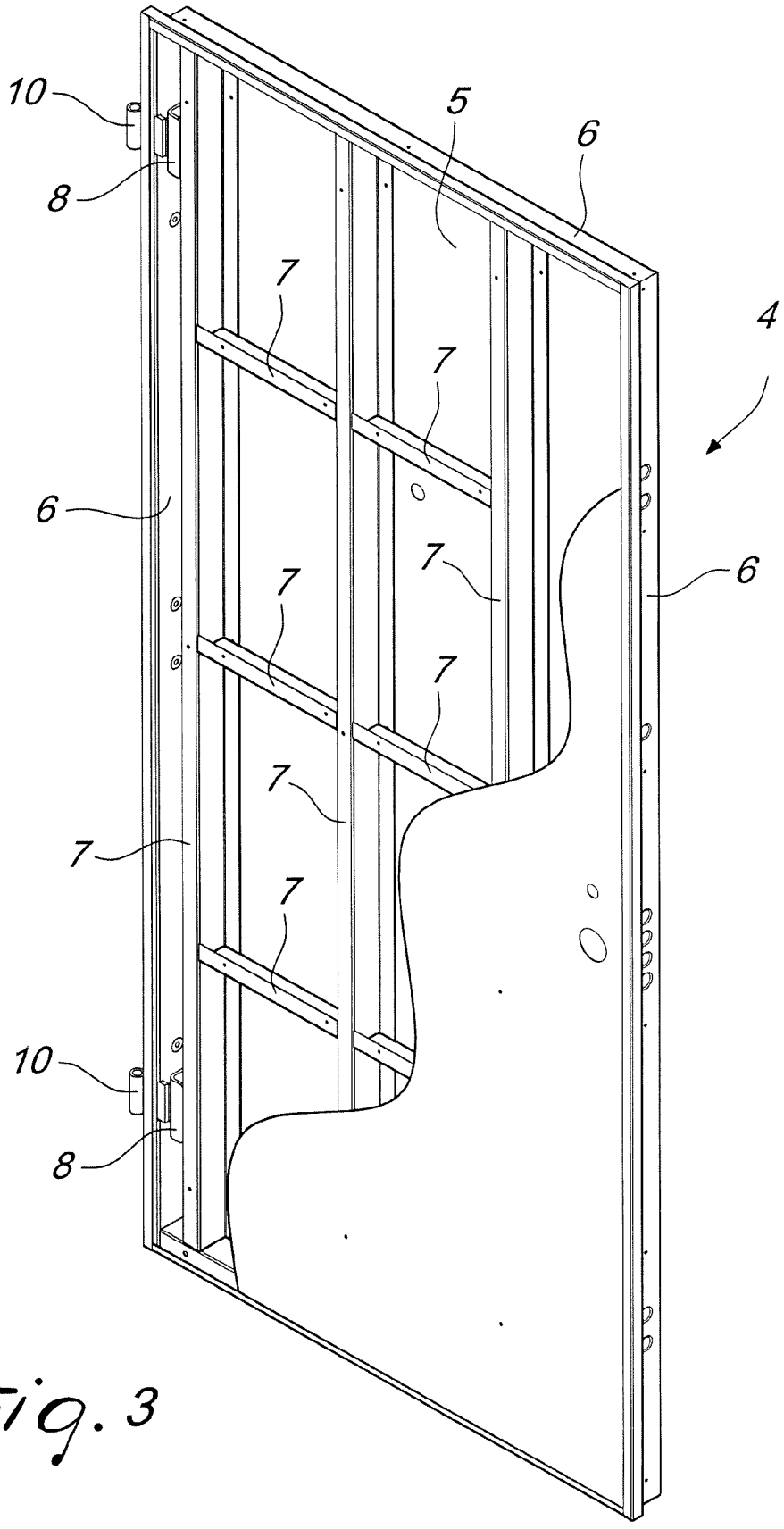


Fig. 3

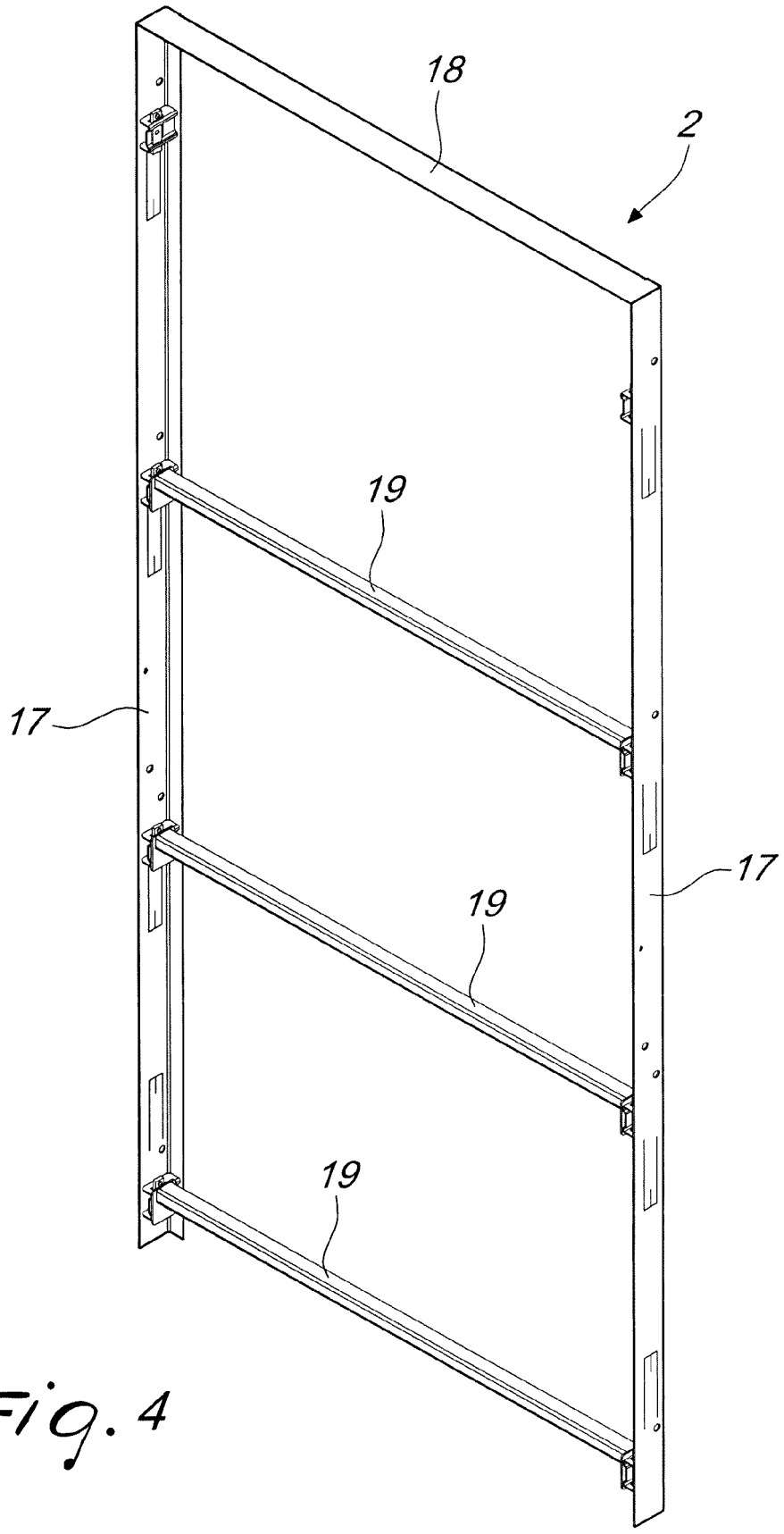


Fig. 4

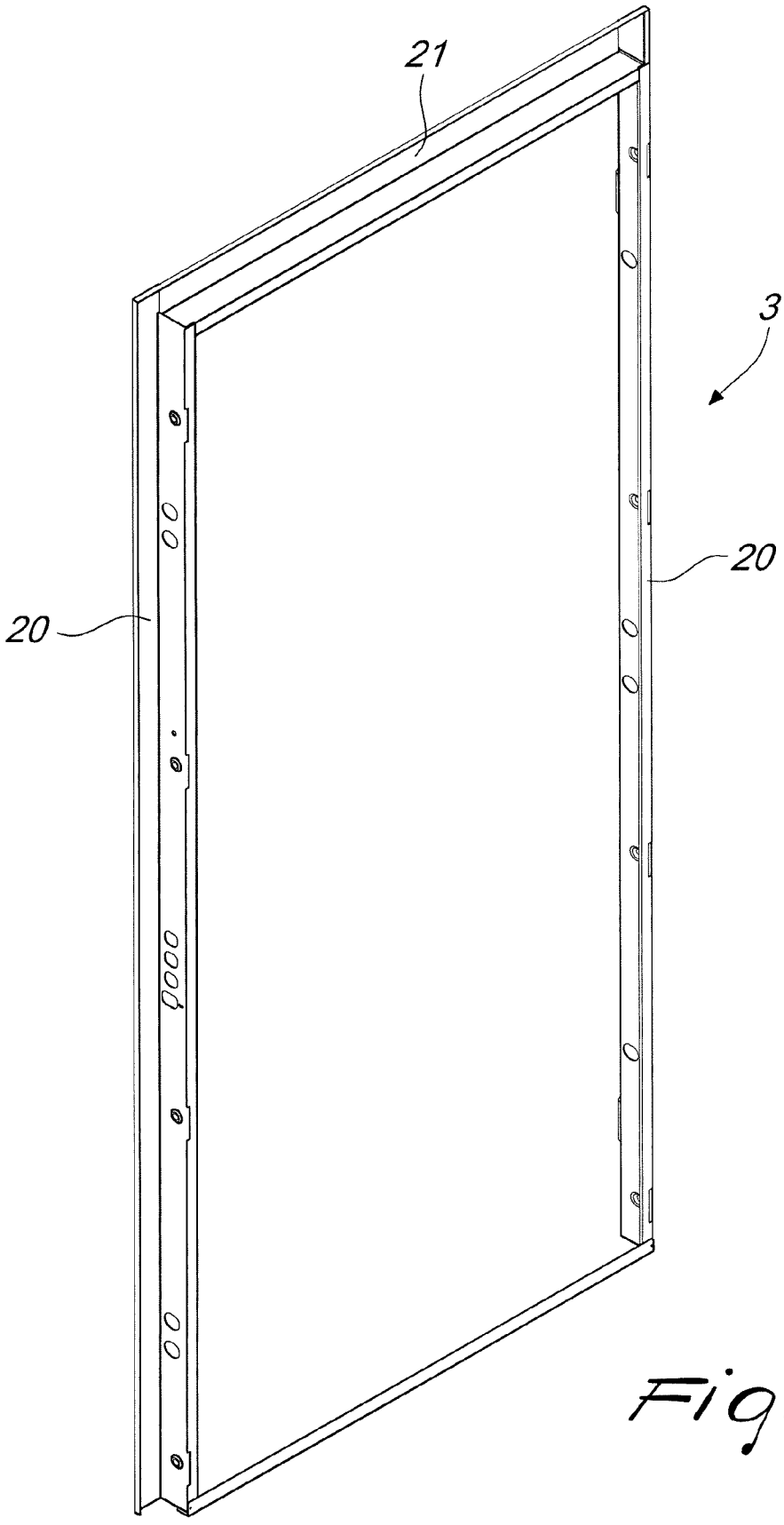


Fig. 5

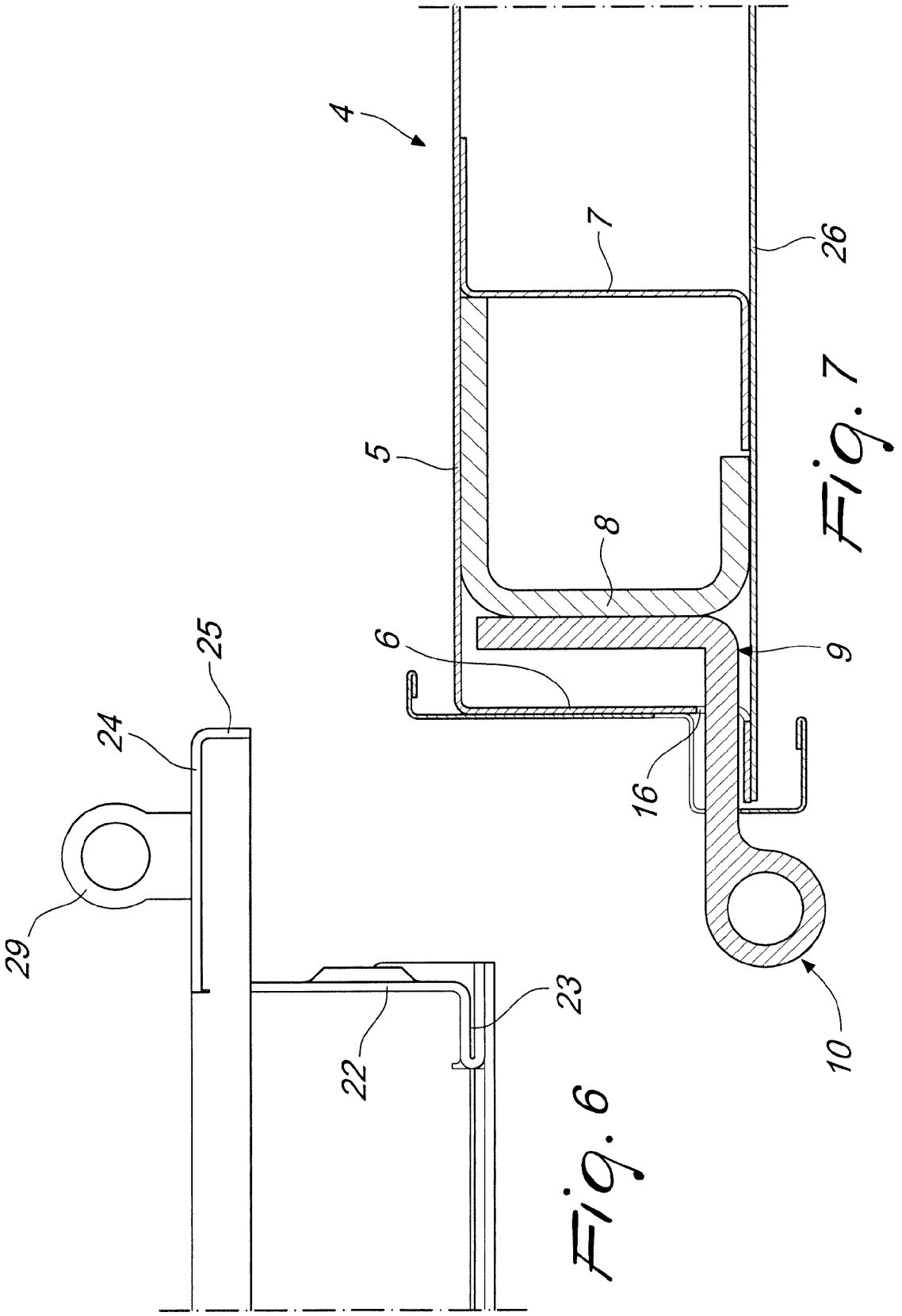


Fig. 7

Fig. 6

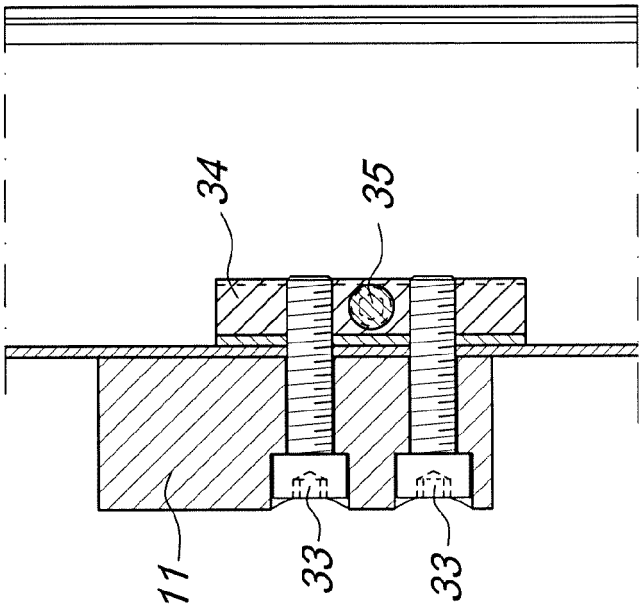


Fig. 10

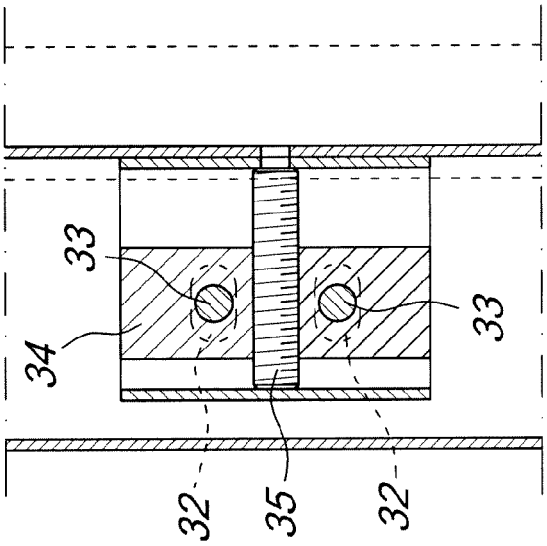


Fig. 9

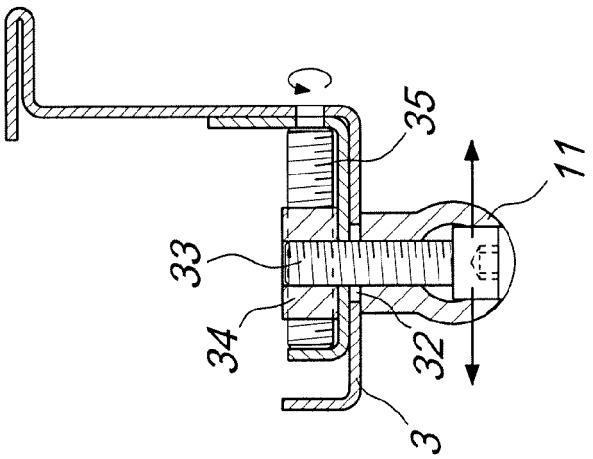


Fig. 8

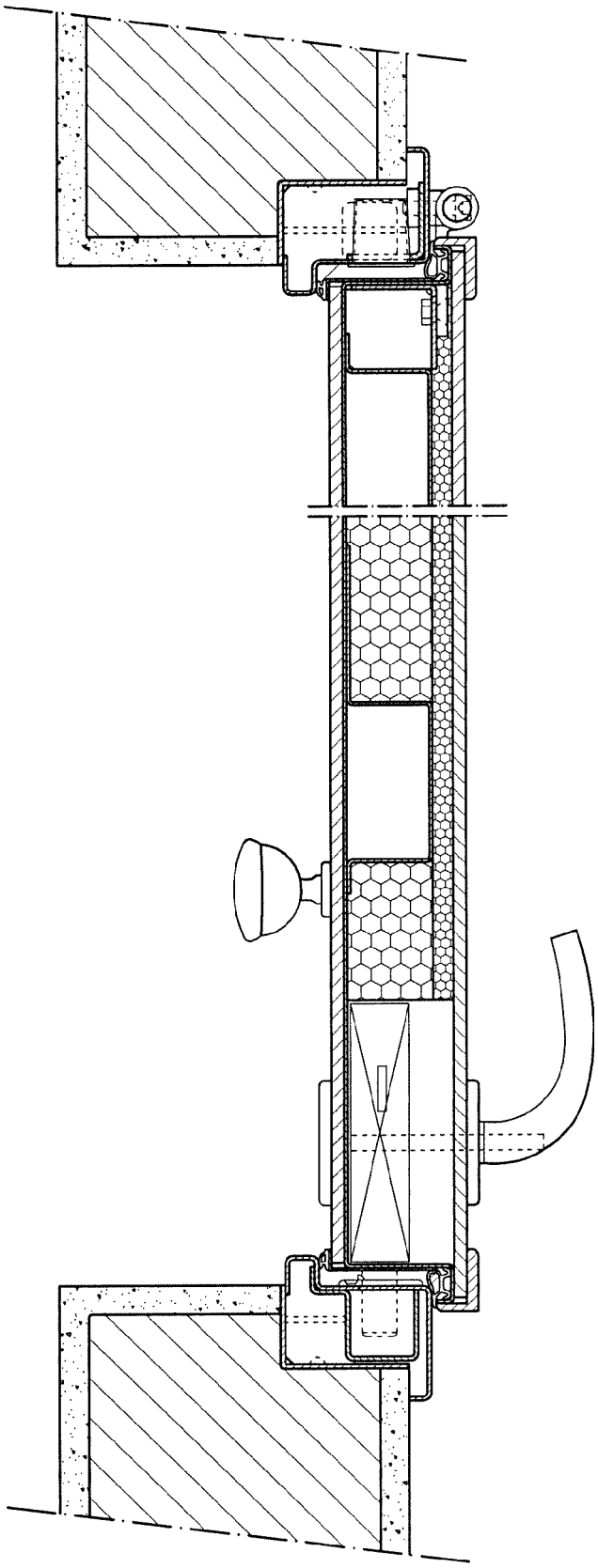


Fig. 11
PRIOR ART

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EUROPEAN SEARCH REPORT

Application Number
EP 15 42 5032

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y	FR 2 701 286 A1 (DECAYEUX ETS [FR]) 12 August 1994 (1994-08-12) * figures 2-3 *	1-12	INV. E06B1/12 E06B1/52 E06B3/70 E06B3/82 E06B5/11
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TECHNICAL FIELDS SEARCHED (IPC)

E06B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	3 November 2015	Blancquaert, Katleen

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