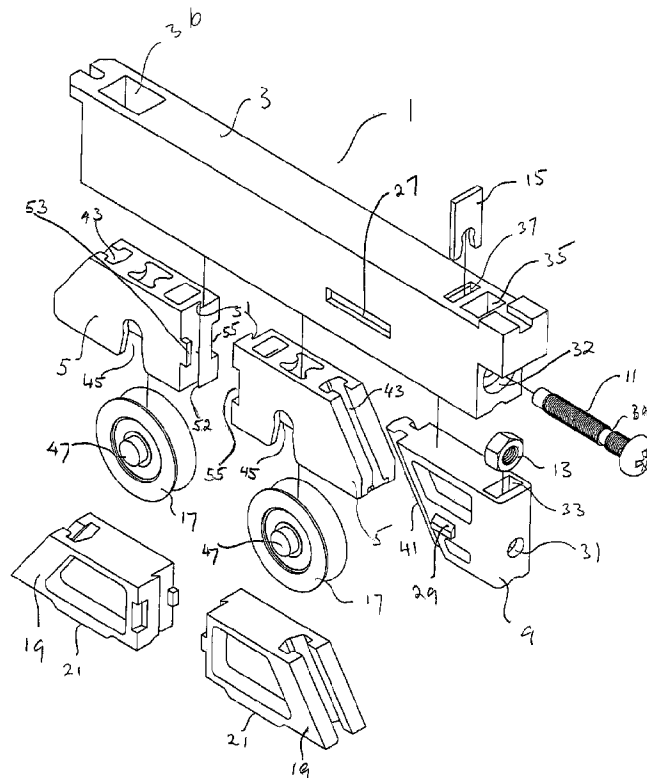




(86) **Date de dépôt PCT/PCT Filing Date:** 2011/02/17
 (87) **Date publication PCT/PCT Publication Date:** 2011/08/25
 (45) **Date de délivrance/Issue Date:** 2018/09/25
 (85) **Entrée phase nationale/National Entry:** 2013/07/12
 (86) **N° demande PCT/PCT Application No.:** AU 2011/000159
 (87) **N° publication PCT/PCT Publication No.:** 2011/100788
 (30) **Priorité/Priority:** 2010/02/17 (AU2010900632)

(51) **Cl.Int./Int.Cl. E05D 15/06** (2006.01),
E05D 13/00 (2006.01), **E06B 3/46** (2006.01)
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(54) **Titre : CHARIOT REGLABLE**
 (54) **Title: ADJUSTABLE CARRIAGE**



(57) **Abrégé/Abstract:**

An adjustable carriage for a panel comprising, an elongate housing having a cavity and a bottom edge, a first slidable member, a second slidable member, and displacement means, wherein the elongate housing is adapted to receive, the first slidable member and second slidable member in the cavity in abutment with each other, and the displacement means are adapted to exert pressure against at least one of the slidable members to cause them to change their height within the cavity with respect to the bottom edge.

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau(43) International Publication Date
25 August 2011 (25.08.2011)

PCT

(10) International Publication Number
WO 2011/100788 A1

(51) International Patent Classification:

E05D 15/06 (2006.01) E06B 3/46 (2006.01)
E05D 13/00 (2006.01)

(21) International Application Number:

PCT/AU2011/000159

(22) International Filing Date:

17 February 2011 (17.02.2011)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

2010900632 17 February 2010 (17.02.2010) AU

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(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report (Art. 21(3))

(54) Title: ADJUSTABLE CARRIAGE

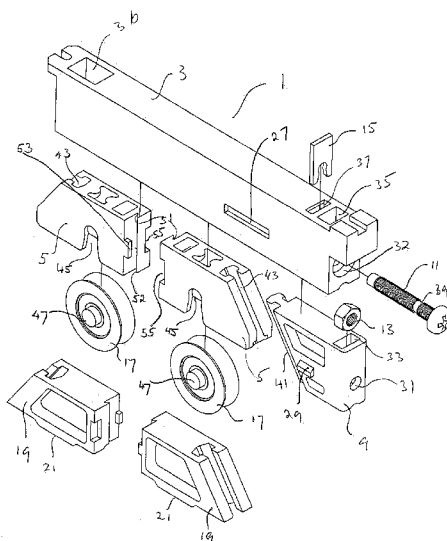


Fig. 1

(57) Abstract: An adjustable carriage for a panel comprising, an elongate housing having a cavity and a bottom edge, a first slidable member, a second slidable member, and displacement means, wherein the elongate housing is adapted to receive, the first slidable member and second slidable member in the cavity in abutment with each other, and the displacement means are adapted to exert pressure against at least one of the slidable members to cause them to change their height within the cavity with respect to the bottom edge.

TITLE OF THE INVENTION**ADJUSTABLE CARRIAGE**

5

FIELD OF THE INVENTION

This invention relates to an adjustable carriage. It relates particularly but not exclusively to an adjustable carriage suitable for use with sliding doors and windows.

10

BACKGROUND OF THE INVENTION

Sliding doors are generally provided with an assembly with rolling wheels at the bottom of a door. The rolling wheels which are generally located within an aluminium extrusion provided at the bottom of the door may be arranged to roll along a trackway provided on the floor so that the door may be slid sideways.

However, as the walls and floors of buildings are not as a general rule perfectly aligned, and dimensional sizing is sometimes inaccurate, there needs to be some capacity in the rolling wheel assembly to overcome the difficulties such imperfections in buildings provide.

There have been rolling assemblies employing a degree of adjustability. However, the constructions generally employed have been found to suffer from relatively high failure rates over extended periods of time. Furthermore, they may not be ideal at coping with sloping trackways.

It is an object of the invention to provide an improved adjustable carriage which is suitable for use with panels, or at least to provide an alternative for those concerned with adjustable carriages.

30

SUMMARY OF THE INVENTION

One aspect of the invention provides an adjustable carriage, for a panel, including

5 a first slidable member,

a second slidable member, and

10 displacement means for exerting pressure to cause the slidable members to slide to respective appropriate levels;

wherein the slidable members are mounted for relative vertical movement between the slidable members to accommodate variations in angle.

15 The pressure is preferably lateral pressure.

The first and second slidable members are preferably in slidable abutment with each other.

20 The slidable members preferably each include at least one respective stop wherein the stops are co-operable to limit the relative vertical movement between the slidable members.

25 The first slidable member may include a ramped trackway in a slidable arrangement with the displacement means.

The displacement means may include an abutment member in a slidable arrangement with the first slidable member. Preferably the displacement means include a bolt rotatable to exert said pressure.

30

The first slidable member may be substantially identical to the second slidable member.

Preferably each of the slidable members respectively carries at least one wheel.

5 The carriage may include an elongate housing having a cavity and a bottom edge wherein the slidable members slide to the respective appropriate levels with respect to the bottom edge.

10 Preferably the slidable members are formed of plastic. Preferably the housing is formed of plastic.

Another aspect of the invention provides a device, for bearing load to vertically space an element from another element, including

15 two or more members, and

structure shaped to co-operate with the members such that each member slides along a respective slide path;

20 wherein the slide paths are inclined and arranged such that upward movement of one of the members along its slide path causes the other member to move downwardly along its slide path whereby the members move to respective appropriate levels to accommodate any misalignment of the elements whilst sharing the load.

25 The structure may include a ramp along which one of the members may slide, in which case the ramp and the one of the members are preferably co-operably formed such that the one of the members is secured to the ramp.

Preferably at least one of the members includes a ramp along which the structure may slide.

30 The slide paths may upwardly converge such that the load drives the members towards each other.

Preferably the members are in abutment.

5 A displacement means, for driving at least a portion of the structure to adjust a spacing of the element from the other element, may be provided. Preferably the displacement means horizontally drives the portion of the structure, which portion of the structure may include a or the ramp along which one of the members may slide. Most preferably the displacement means includes a rotatable threaded element.

10 Each member preferably carries at least one wheel for riding along the other element. The members may be substantially identical.

The element may be a panel. The other element may be a building portion underlying the element, e.g. a track underlying the element.

15

Also disclosed is an adjustable carriage for a panel comprising,

an elongate housing having a cavity and a bottom edge,

20 a first slidable member,

a second slidable member, and

displacement means,

25

wherein the elongate housing is adapted to receive, the first slidable member and second slidable member in the cavity in abutment with each other, and

30 the displacement means are adapted to exert pressure against at least one of the slidable members to cause them to change their height within the cavity with respect to the bottom edge.

The first and second slidable members may be in slidable abutment with each other.

5 The elongate housing may be moulded or cast. It may be moulded from plastics material. The cavity in the elongate housing may stretch lengthways in the elongate housing. The bottom edge of the elongate housing may be open to give access to the cavity.

10 The slidable members and displacement means may also themselves comprise moulded or cast components. They may be moulded from plastics material.

The first slidable member may be shaped so that it can be slid through the open end of the elongate housing into the cavity to fit snugly therein with the sides of the slidable member in abutment with the interior sides of the cavity. The interior sides of the cavity
15 may be generally parallel so as to allow a degree of longitudinal sliding movement of the slidable member within the cavity.

One end of the first slidable member may comprise a ramped trackway in the cavity. The ramped trackway may co-operate with a corresponding trackway on one of the
20 slidable members to facilitate vertical adjustment of the height of the slidable member within the cavity.

The second slidable member may similarly be slidable within the cavity, the cavity being large enough to accommodate both the first and second slidable member together. The
25 first and second slidable member may incorporate engagement means to interengage the first and second slidable member when fitted in the cavity. The engagement means may allow slidable relative vertical movement between the first and second slidable member. The extent of relative vertical movement may be limited by stop means associated with the first and second slidable member.

30

The displacement means may comprise an abutment member. The abutment member may be snugly receivable within the cavity. It may be formed with a ramp adapted to cooperate with a corresponding ramp provided on one of the slidable members. The ramps of the abutment member and slidable member may be formed with trackway means securing the two members together in a slidable arrangement.

The displacement means may comprise pusher means adapted to slide the abutment member longitudinally within the cavity. The pusher means may comprise a bolt held within the elongate housing. The bolt may have a nut threaded thereon. The nut may engage with a cavity provided in the abutment member so as to allow the abutment member to be moved laterally when the bolt is screwed into and out of the nut.

Alternatively, the nut may engage a cavity provided in the elongate housing.

The first and second slidable member may be of identical construction to each other. They may include means for holding a wheel. The means may be adapted to allow the axles of a wheel to be snap fitted into openings provided at the sides of the slidable members.

The foregoing was intended as a summary only and of only some of the aspects of the invention. It was not intended to define the limits or requirements of the invention. Other aspects of the invention will be appreciated by reference to the detailed description of the preferred embodiments. Moreover, this summary should be read as though the claims were incorporated herein for completeness.

Preferred aspects of the invention will now be described with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 shows an axonometric exploded view of an adjustable carriage according to the invention in a form with or without wheels;

5

Figure 2 shows an axonometric view of a longitudinal cross section taken through the assembled wheeled carriage of Figure 1;

Figure 3 shows the cross section of Figure 2 in elevation with the wheels retracted;

10

Figure 4 shows the cross section of Figure 2 in elevation with the wheels extended;

Figure 5 shows an axonometric view of the elongate housing of Figure 1;

15 Figure 6 shows an underneath axonometric view of Figure 5;

Figure 7 shows a longitudinal elevational cross section of Figure 5;

Figure 8 shows a cross section B-B of Figure 7;

20

Figure 9 shows an axonometric view of an abutment member;

Figure 10 shows an axonometric view of the abutment member of Figure 9 rotated 90°;

25 Figure 11 shows an elevational view of the abutment member of Figure 9;

Figure 12 shows the section D-D taken through Figure 11;

Figure 13 shows an axonometric view of the slidable member;

30

Figure 14 shows an upside down axonometric view of Figure 13;

Figure 15 shows a longitudinal cross section taken through Figure 13;

Figure 16 shown the cross section C-C taken through Figure 16;

5

Figure 17 shows an exploded view of an alternative adjustable carriage according to the invention;

Figure 18 shows an axonometric longitudinal cross section taken through the assembled carriage of Figure 17;

10

Figure 19 shows an elevational view of Figure 18 in the retracted configuration;

Figure 20 shows an elevational view of Figure 18 in the extended configuration;

15

Figure 21 shows an axonometric view of an alternative slidable member according to the invention;

Figure 22 shows an upside down axonometric view of Figure 21;

20

Figure 23 shows a plan view of Figure 21;

Figure 24 shows an elevational view of Figure 21; and

25 Figure 25 shows an end on elevational view of Figure 21.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The various elements identified by numerals in the drawings are listed in the following integer list.

30

Integer List

	1	Adjustable carriage
	3	Elongate housing
	5	Slidable member
5	9	Abutment member
	11	Bolt
	13	Nut
	15	Restraining plate
	17	Wheel
10	19	Alternative slidable member
	21	Flat base
	23	Cavity
	25	Bottom edge
	27	Slot
15	29	Ramped protrusion
	31	Bolt hole
	32	Opening
	33	Nut cavity
	35	Moulding cavity
20	36	Moulding cavity
	37	Restraining plate cavity
	39	Narrow thread free zone
	41	Ramped male track
	43	Ramped female track
25	45	Axle recess
	47	Axle
	51	Recess
	52	Protruding edge
	53	Stop

	55	Recess
	57	Ramped male track
	60	Adjustable carriage
	62	Elongate housing
5	64	Abutment member
	66	Cavity
	68	Nut
	70	Opening
	72	Bolt
10	74	Steel insert
	76	Moulded slot
	78	Ramped protrusion
	80	Slot
	82	Ramped male track
15	84	Ramped male track

Referring to Figures 1 to 16 and 22 to 25, there is shown an adjustable carriage assembly 1 and its components. The adjustable carriage assembly comprises an elongate housing 3. The elongate housing may be manufactured by any suitable manufacturing process such as injection moulding, casting, etc although an injection moulded plastic is preferred. The housing may be shaped so that it can be readily slotted into an aluminium extrusion or similar which may typically be fitted underneath the bottom edge of a door panel or window.

The elongate housing is dimensioned so that it is formed with an open ended cavity 23 which is shaped to snugly receive the two slidable members 5 and abutment member 9. The interior sides of the cavity 23 are flat and parallel as are the exterior sides of the abutment member and two slidable members. The dimensions are such that the abutment member and slidable members when fitted snugly within the cavity 23 are longitudinally slidable within the cavity.

A bolt 11 is arranged to fit through the opening 32 provided at one end of the cavity and also through the bolt hole 31 formed in the abutment member 9.

5 A nut 13 is slidable into the nut cavity 33 formed at one end of the abutment member 9 for purposes to become apparent.

Similarly, a restraining plate 15 resembling a circlip 15 is slidable into the restraining plate cavity 37 so that it fits over the narrow thread free zone 39 of the bolt to hold it in
10 position when the components of the adjustable carriage are assembled.

Wheels 17 provided with axles 47 are held in each of the slidable members by being friction fitted into the axle recesses 45. The natural resilience of plastics material from which the slidable members may be moulded allows the axles to be snap fitted into the
15 top of these recesses to hold them in place and allow them to rotate freely.

It is noted that Figure 1 shows alternative slidable members 19 without wheels whose purpose will be described in more detail hereinafter. Each of these slidable members 19 have a flat base 21.

20 Opposed sides of the elongate housing 3 are provided with slots 27 arranged to receive the ramped protrusions 29 provided on opposite sides of the abutment member. This serves to hold the abutment member within the cavity 23 after it has been pushed home into the cavity through the opening formed at the bottom edge 25 of the elongate
25 housing.

It is noted that the elongate housing 3 is formed with moulding cavities 35 and 36 which serve no purpose other than to reduce use of moulding material such as plastic in the moulding process. Similar cavities are also formed in the slidable and abutment
30 members. The elongate housing may also incorporate extensions or specific profiles at one or both ends to facilitate mounting.

The abutment member is provided with a male track 41 formed as a ramp by virtue of the fact that it runs at an angle to the vertical.

5 The ramped male track 41 is slidable within the ramped female track 43 formed on the slidable member 5, the ramped male track having a generally T-shaped configuration which slides within the generally T-shaped hollow formed as the ramped female track 43.

10 Similarly, an internal ramped male track 57 is provided in the cavity 23 at one end of the cavity, the ramped male track 57 being slidable within the ramped female track 43 of the other of the two slidable members.

The slidable members have a protruding edge 52 on an end face, with a generally
15 triangular shaped recess 51 defined by the protruding edge. The arrangement is such that protruding edges of the two slidable members may co-operate to hold the two slidable members in abutment with each other whilst allowing relative vertical movement between the two.

20 A stop 53 which can move up and down in the recess 55 serves to limit the extent of relative vertical movement between the two slidable members 5.

To assemble the adjustable carriage, the two slidable members with wheels in place are abutted against each other with their protruding edges overlapped and the ramped male
25 track of the abutment member is slid into the ramped female track of one of the slidable members. This assembly of three components is then pushed up into the cavity 23 in such a way that the ramped female track 43 of one of the slidable members co-operates with the ramped male track 57 provided internally of the elongate housing. It is noted that the nut 13 will have been placed into the nut cavity 33 prior to the assembly of the
30 two slidable members and abutment member being pushed up into the cavity 23.

As the assembly is pushed into the cavity, the ramped protrusions 29 on either side of the abutment member co-operate with the slots 27 on either side of the elongate housing to retain the abutment member in the cavity in connection with the slidable member 5.

5

The height of the slidable members 5 within the cavity can be adjusted by turning the bolt 11 to move the abutment member longitudinally within the cavity.

Typically, the adjustable carriage will be mounted within an extrusion or a recess provided at the bottom of a sliding panel or door. After it has been put in place and the wheels are arranged on a track on the floor, the bolt 11 is adjusted to ensure the slidable members and hence the associated wheels 17 are at an appropriate level to provide a correct fit. Even if the track on which the wheels run happens to be at a slight angle with respect to the bottom of the panel, the limited relative vertical movement between the two slidable members 5 allows slight variations in the angle of the track to be accommodated.

Whilst the description in relation to Figures 1 to 16 has dealt largely with an adjustable carriage having wheels, it is to be appreciated that the carriage may be provided without wheels if the slidable members 5 are replaced by the alternative slidable members 19. As these have a flat bottom edge 21, they may be used in place of the wheeled slidable members 5 in circumstances where the height of a panel put in place needs to be adjusted without any need for the panel to be moved. The centre of the base may incorporate a channel or similar to fit over a track.

25

It should also be appreciated that the adjustable carriage can be used at top, bottom or sides of panels to provide slidable movement or to fix the panels in place depending on the circumstances.

The particular embodiment of the invention described with reference to Figures 1 to 16 deals with an arrangement in which the head of the bolt used to adjust the height of the

30

carriage remains fixed in position relative to the end of the elongate housing as the circlip 15 prevents movement of the bolt.

5 In some circumstances, it may be preferable to have a slightly different arrangement in which the head of the adjustment bolt is moveable. Such an alternative arrangement will be described with reference to Figures 17 to 25. The alternative adjustable carriage described in relation to these Figures generally indicated by the reference numeral 60 comprises an elongate housing 62 having most of the features already described with reference to the previous embodiment but with a deeper opening 70 to accommodate
10 the bolt 72. The slidable members are identical to those already described with reference to the previous embodiment as is the mode of co-operation between the slidable members and the abutment member 64.

15 However, the elongate housing 62 is provided with a cavity 66 to receive the nut 68 arranged so that it is held in fixed position relative to the elongate housing.

The abutment member 64 differs from the abutment member previously described in that it includes a moulded slot 76 for receiving a steel insert 74.

20 The abutment member 64 having ramp protrusions 78 on opposed sides can be held within the elongate housing 62 by the slots 80 in a similar manner to that already described with regard to the previous embodiment. The ramped male track 82 of the abutment member serves to connect with the slidable member 5 in similar manner as does the ramped male track 84 of the elongate housing 62.

25

To adjust the height of the slidable members, the bolt is screwed in and out of the nut, the end of the bolt being in abutment with the steel insert 74.

30 As in the previous case, an alternative construction in which the slidable members 5 are replaced by fixed alternative slidable members 19 is also possible.

Whilst the above description includes the preferred embodiments of the invention, it is to be understood that many variations, alterations, modifications and/or additions may be introduced into the constructions and arrangements of parts previously described without departing from the essential features or the spirit or ambit of the invention.

5

It will be also understood that where the word "comprise", and variations such as "comprises" and "comprising", are used in this specification, unless the context requires otherwise such use is intended to imply the inclusion of a stated feature or features but is not to be taken as excluding the presence of other feature or features.

10

The reference to any prior art in this specification is not, and should not be taken as, an acknowledgment or any form of suggestion that such prior art forms part of the common general knowledge.

CLAIMS

1. An adjustable carriage, for a panel, including
 - an elongated housing;
 - a first slidable member receivable in said housing,
 - a second slidable member receivable in said housing, and
 - displacement means for exerting pressure to cause the slidable members to slide to respective appropriate levels and thereby adjust a height of said panel;
 - wherein the slidable members are mounted for relative vertical movement between the slidable members to accommodate variations in angle between a bottom of said panel and an underlying surface.
2. The carriage of claim 1 wherein the pressure is lateral pressure.
3. The carriage of claim 1 or 2 wherein the first and second slidable members are in slidable abutment with each other.
4. The carriage of any one of claims 1 to 3 wherein each slidable member respectively includes at least one stop and the stops are co-operable to limit the relative vertical movement between the slidable members.
5. The carriage of any one of claims 1 to 4 wherein the first slidable member includes a ramped trackway in a slidable arrangement with the displacement means.
6. The adjustable carriage of any one of claims 1 to 5 wherein the displacement means includes an abutment member in a slidable arrangement with the first slidable member.

7. The carriage of any one of claims 1 to 6 wherein the displacement means include a bolt rotatable to exert said pressure.
8. The carriage of any one of claims 1 to 7 wherein the first slidable member is substantially identical to the second slidable member.
9. The carriage of any one of claims 1 to 8 wherein each of the slidable members respectively carries at least one wheel.
10. The carriage of any one of claims 1 to 9 including an elongate housing having a cavity and a bottom edge wherein the slidable members slide to the respective appropriate levels with respect to the bottom edge.
11. The carriage of any one of claims 1 to 10 wherein the slidable members are formed of plastic.
12. The carriage of claim 11 wherein the housing is formed of plastic.

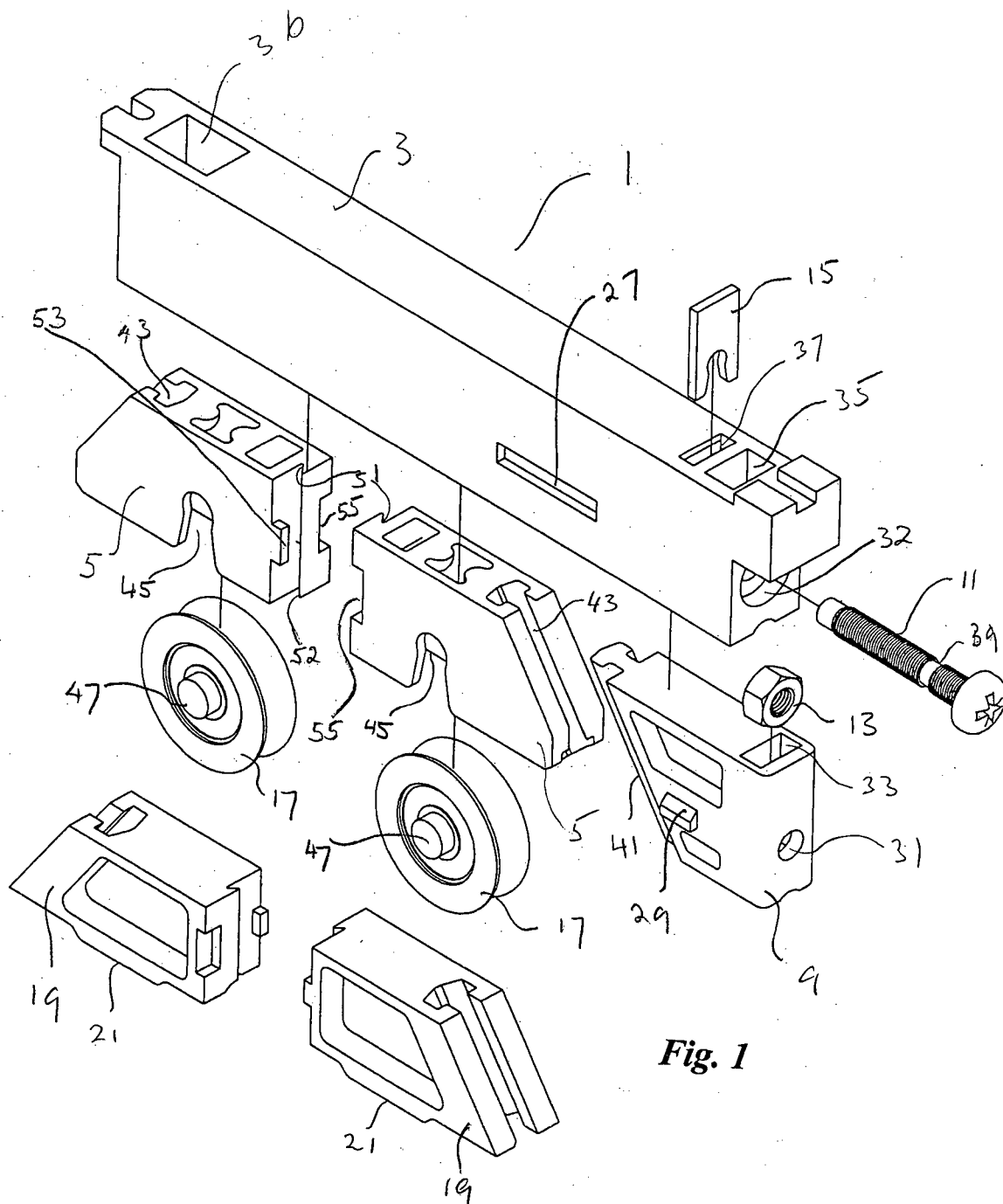


Fig. 1

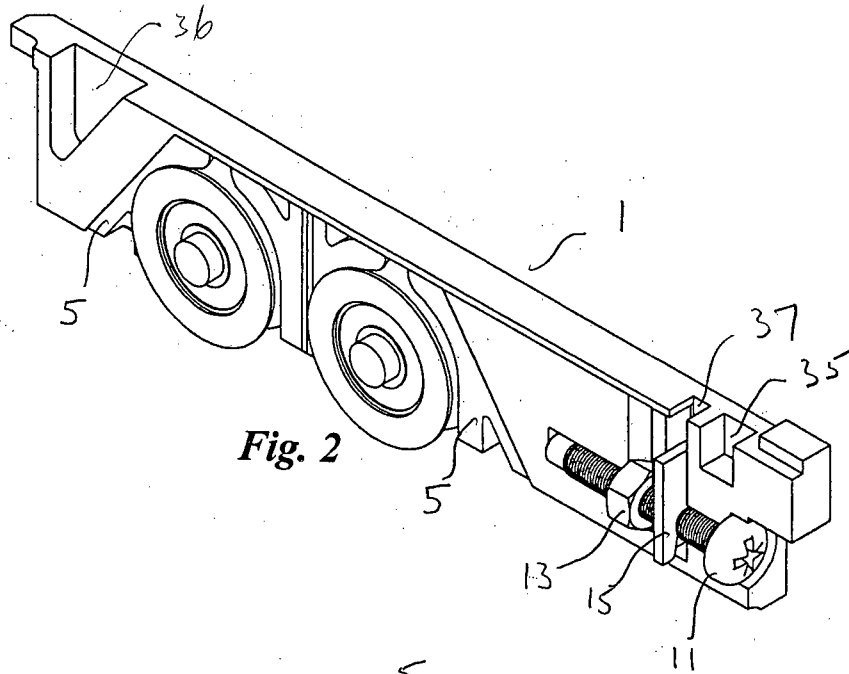


Fig. 2

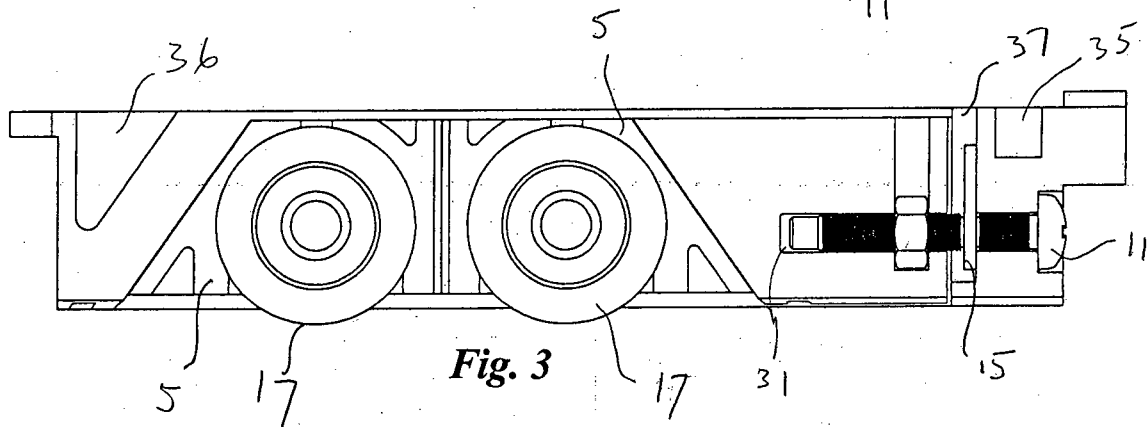


Fig. 3

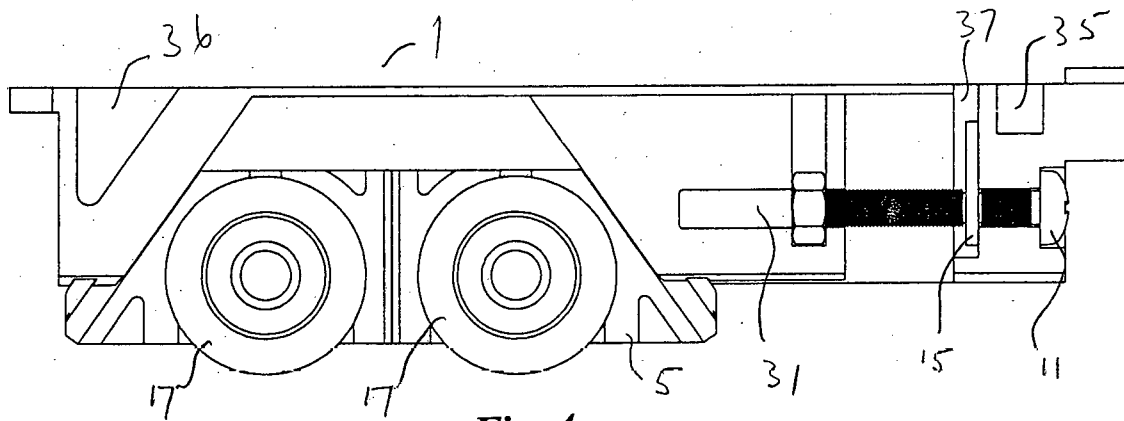


Fig. 4

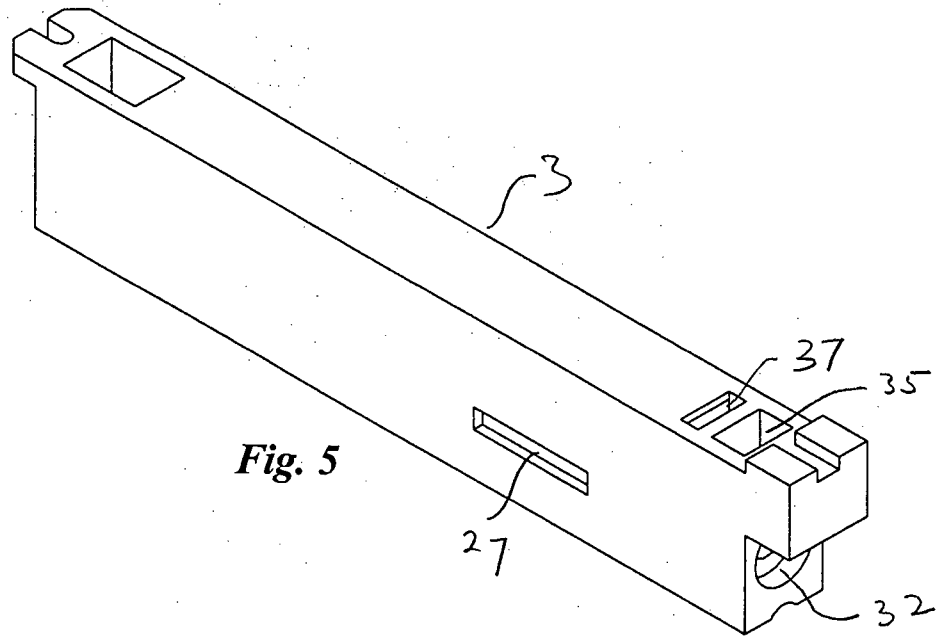


Fig. 5

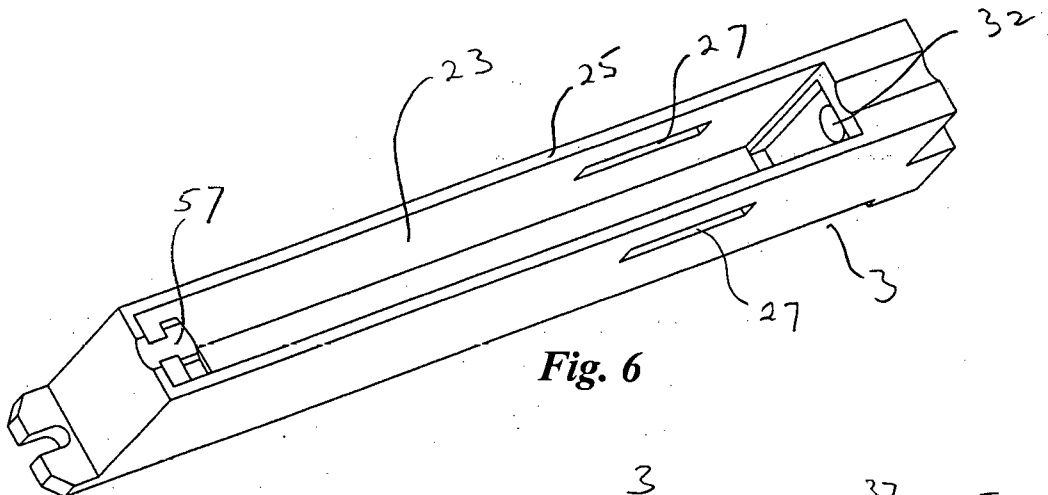


Fig. 6

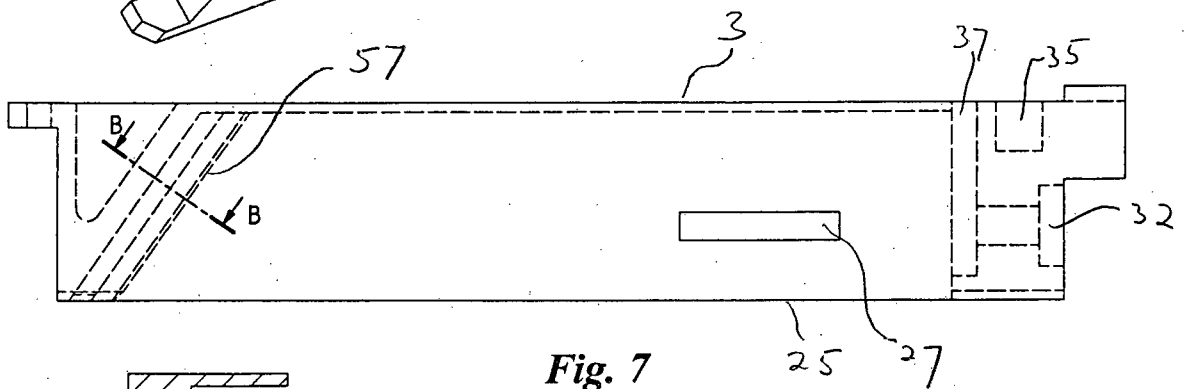
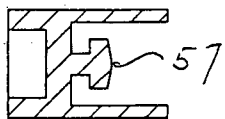


Fig. 7



B-B Fig. 8

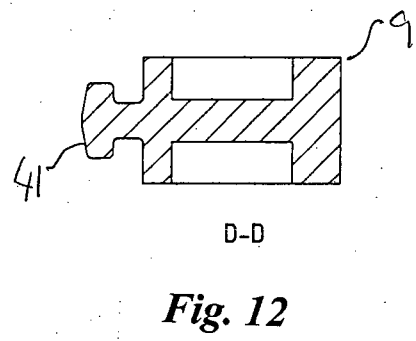
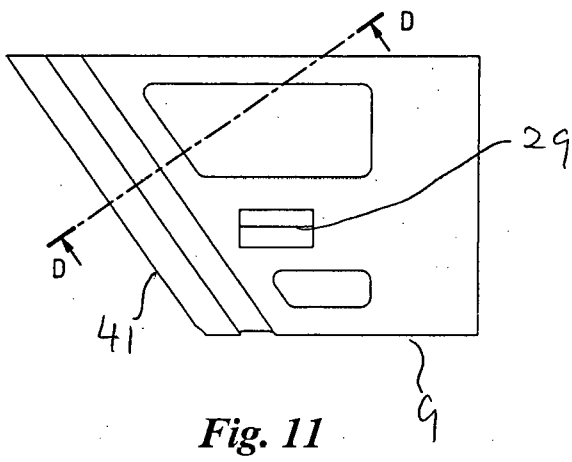
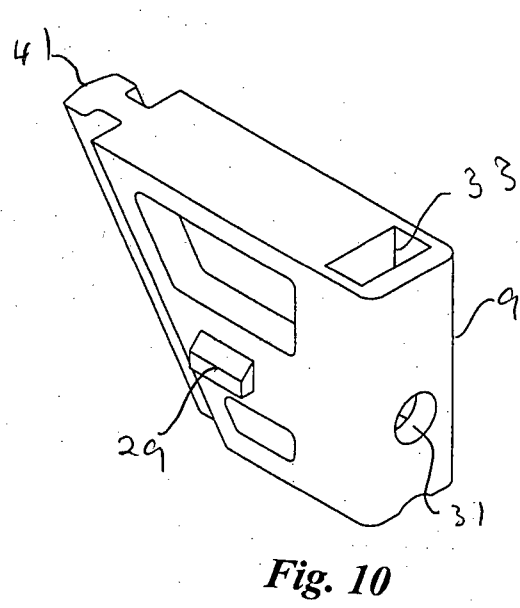
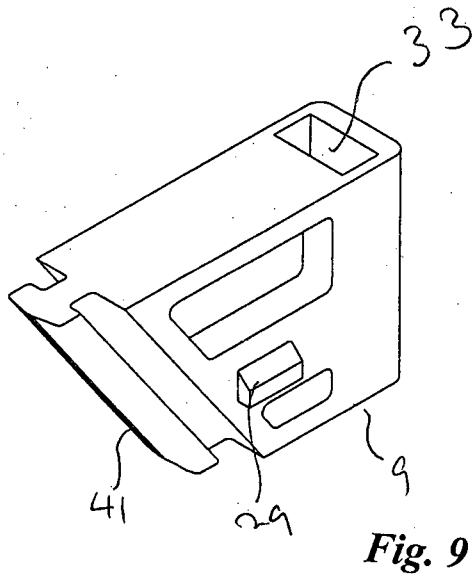


Fig. 14

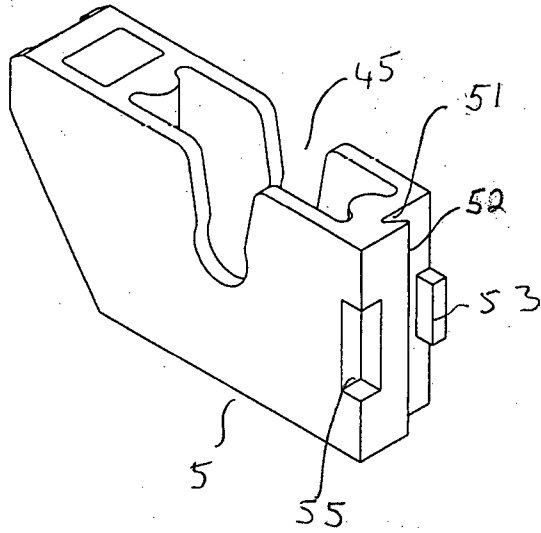


Fig. 13

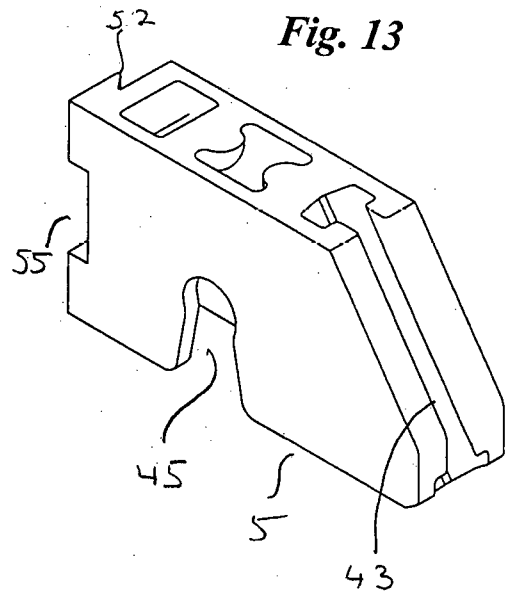


Fig. 15

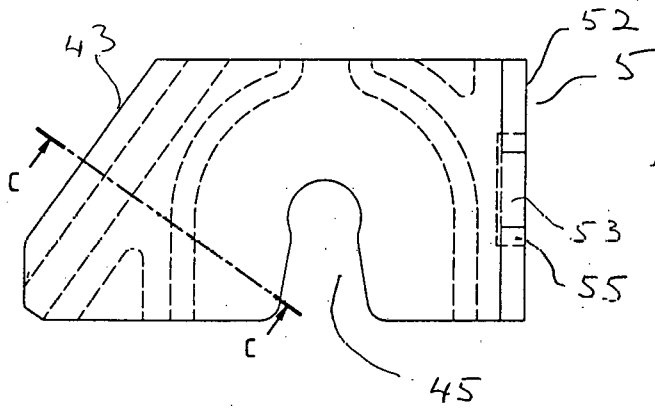
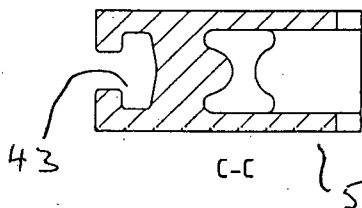


Fig. 16



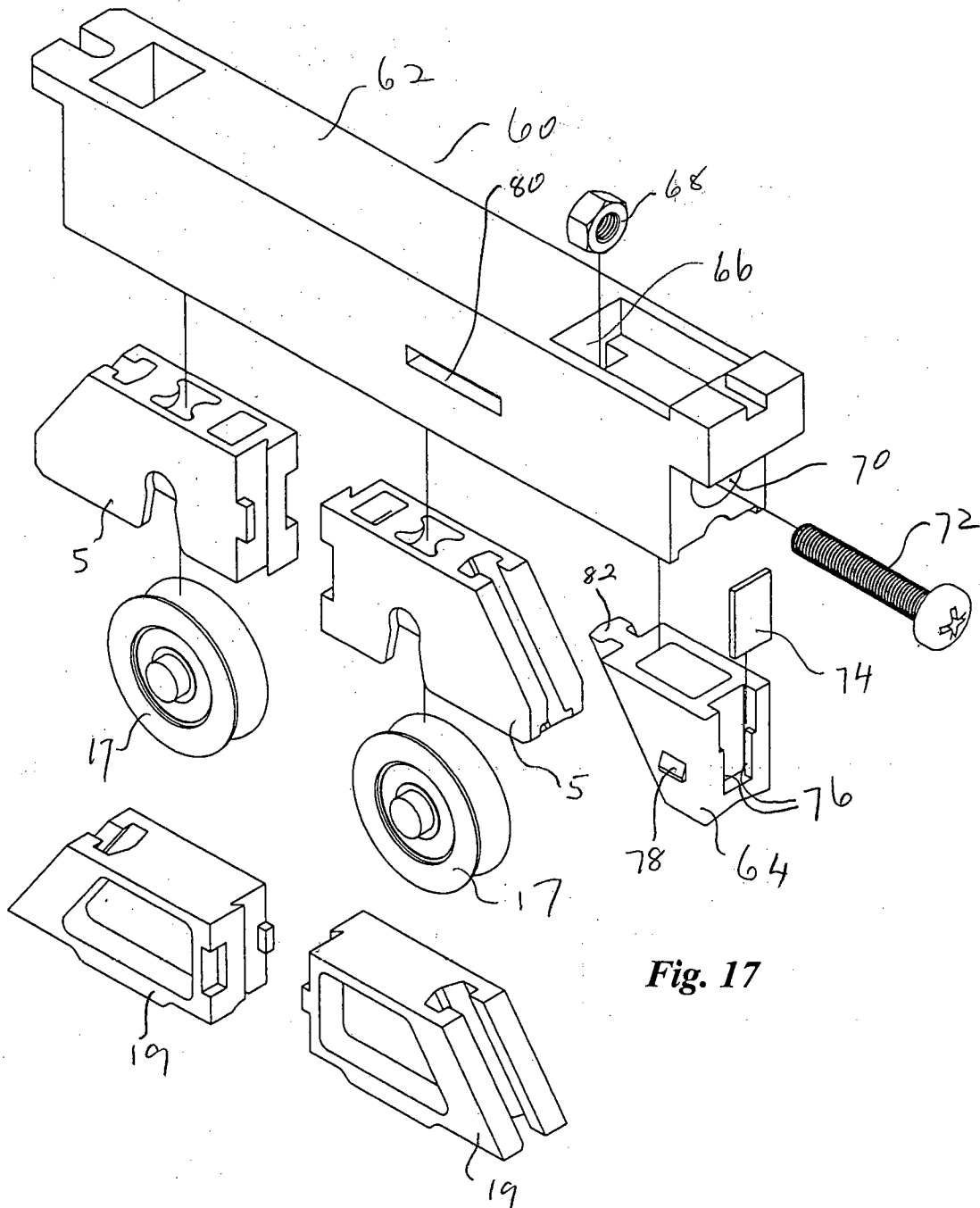


Fig. 17

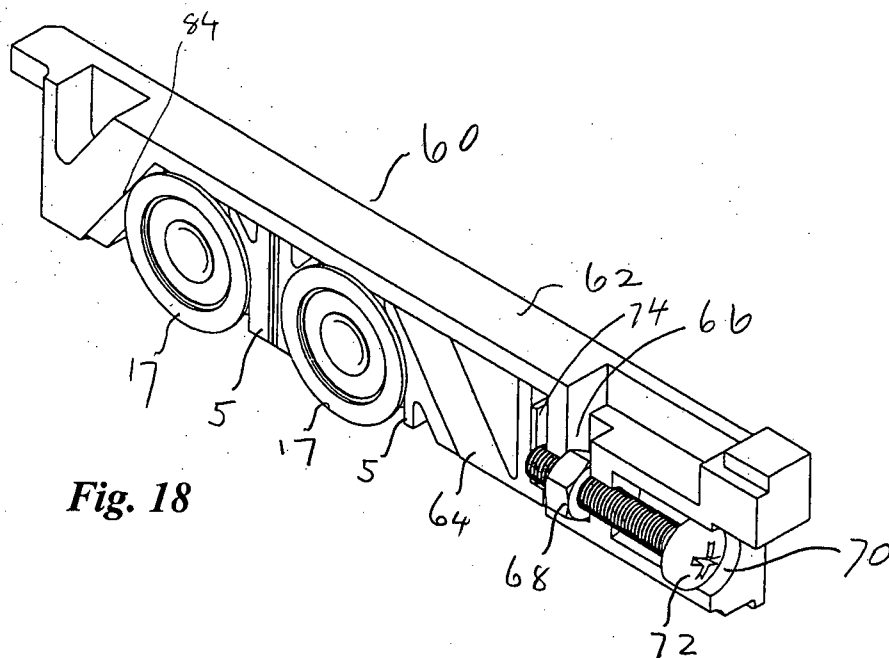


Fig. 18

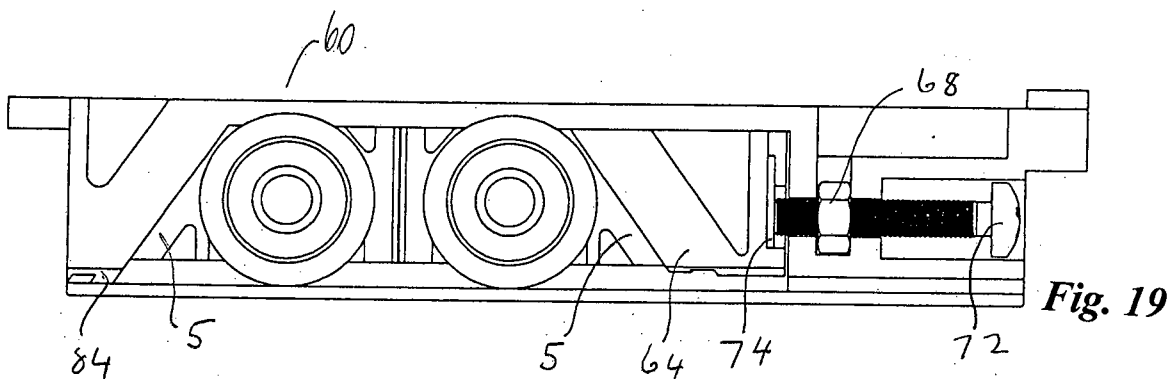


Fig. 19

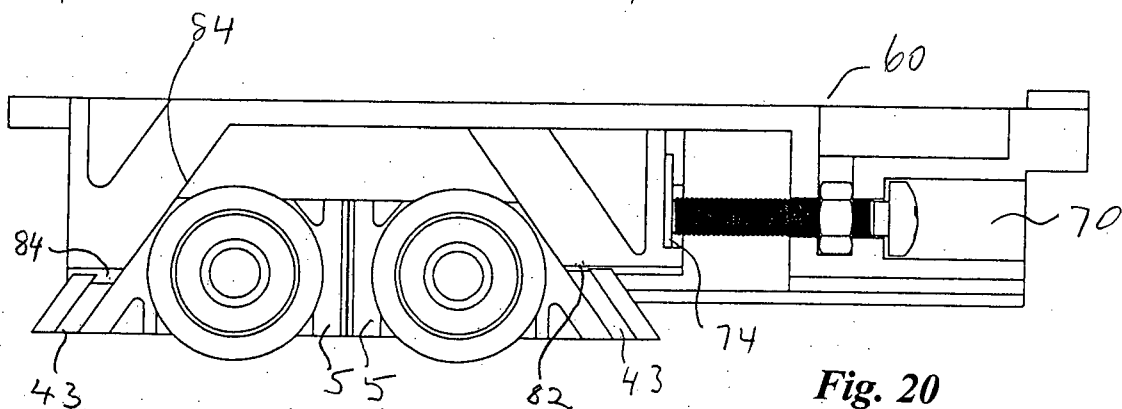


Fig. 20

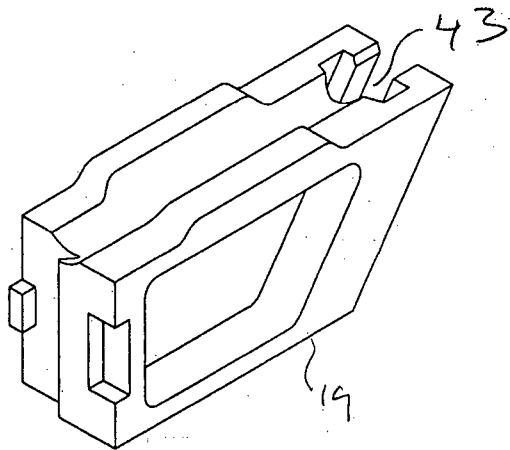


Fig. 22

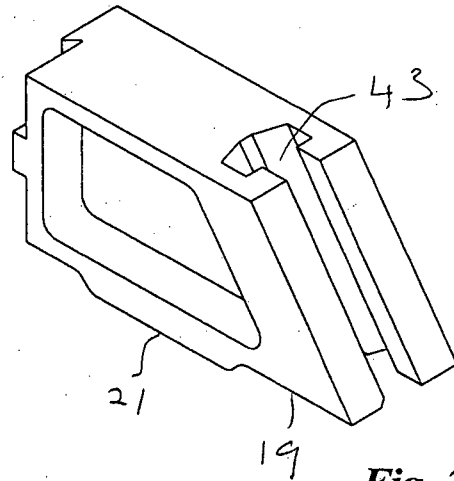


Fig. 21

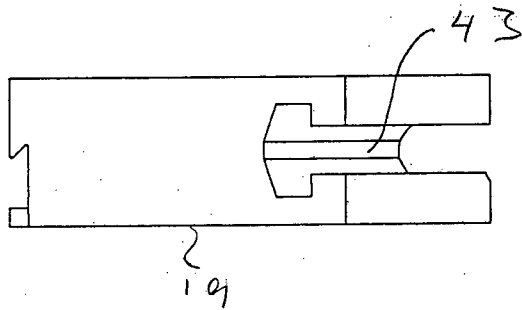


Fig. 23

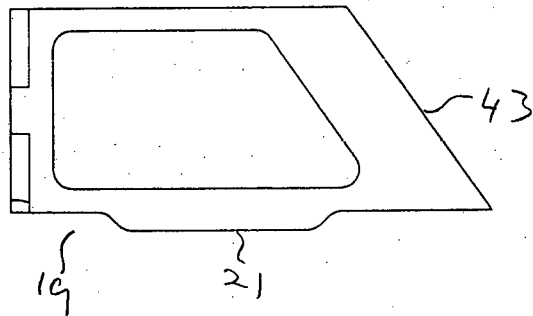


Fig. 24

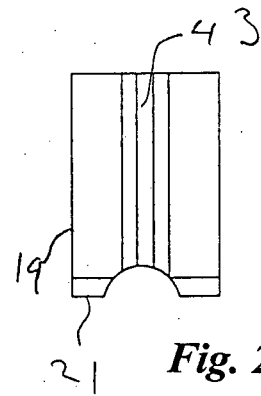


Fig. 25

