



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁵ : E05G 1/00	A1	(11) International Publication Number: WO 94/13918 (43) International Publication Date: 23 June 1994 (23.06.94)
(21) International Application Number: PCT/GB93/02524 (22) International Filing Date: 10 December 1993 (10.12.93) (30) Priority Data: 9226096.7 15 December 1992 (15.12.92) GB 9309878.8 13 May 1993 (13.05.93) GB (71) Applicant (for all designated States except US): KITCHIN ENGINEERING LIMITED [GB/GB]; Brimington Road, Chesterfield S41 7UP (GB). (72) Inventor; and (75) Inventor/Applicant (for US only): WHITFIELD, John [GB/GB]; 126 Bawtry Road, Doncaster DN4 7BP (GB). (74) Agents: HOUGHTON, David et al.; Hulse & Co, Eagle Star House, Carver Street, Sheffield S1 4FP (GB).		(81) Designated States: AT, AU, BB, BG, BR, BY, CA, CH, CZ, DE, DK, ES, FI, GB, HU, JP, KP, KR, KZ, LK, LU, MG, MN, MW, NL, NO, NZ, PL, PT, RO, RU, SD, SE, SK, UA, US, VN, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>
(54) Title: SECURITY DEVICE (57) Abstract The invention relates to a security device, particularly for such as safes that are ordinarily attendant to such as cash dispensing machines and night safes. Such safes are susceptible to attack by the technique generally referred to as ram raiding where heavy equipment such as, for example, motorised mechanical diggers, are employed to break through a wall or a window behind which the safe is located and lift the safe for deposit on to a waiting vehicle. The object of the invention is to provide a security device able to resist such attack for an appreciable time scale, which objective is met by a construction comprising at least one anchor means (2) for affixing to the ground or securing to a floor adjacent and below the location of a safe (1), a pivot means (4) on said at least one anchor means (2), at least one elongate support means (5) pivotally secured to said pivot means on the at least one anchor means (2), said elongate support means (5) to be attached to the safe (1). Preferably, the or each elongate support means (5) has an attendant telescopically located outer encasing means (6), with an attendant means to prevent the removal of the outer encasing means (6) from the elongate support means (5).		

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SECURITY DEVICE

This invention relates to a security device.

For long years financial institutions such as banks have provided so-called night safes accessible to the public outside normal opening hours, into which cash or other valuables can be deposited overnight for safety. Here, an access door is strategically placed in the wall of the building behind which is a safe into which the cash or other valuables fall. More recently there has been the major growth of cash dispensing machines at such as banks, building societies and the like, where a safe is provided frequently containing considerable sums of money, with an attendant dispensing mechanism whereby customers can withdraw cash either during or outside normal opening times.

Theft of cash and/or valuables from a night safe or from the safe attendant to a cash dispenser, is difficult. However, there has been the growth of a variation of the so-called ram raiding technique, where heavy equipment in the form of a motorised mechanical digger with a bucket or a grab is brought to the location of a night safe or cash dispenser, and used to break through the surrounding wall, scoop up the safe and deposit it on to a waiting vehicle. It is even known for, particularly, cash dispensers and attendant safes, to be located behind a glass window and in full view from outside the building and consequently much easier for thieves to reach the dispenser and safe. The speed with which this can be done is such that whilst attendant security alarms are triggered, the safe is driven away before security forces, police or

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otherwise, can reach the scene. Once removed and secreted away, the thieves have ample time to attend to the actual opening of the safe and the removal of its contents.

An inevitable consequence of this form of theft is the
5 considerable damage effected to the structure surrounding the safe. A frequent occurrence is the impact force of the heavy equipment carrying it through the outer wall of a building or the glass window behind which the safe is positioned, to knock the safe from its mounting from where the equipment, such as
10 the bucket or the grab, is used to retrieve it, when not only is there the loss of the safe and its contents, but also major costs in repairing the building, both inside and outside over the area previously occupied by the safe.

The object of the invention is to provide a security
15 means to reduce significantly the ability to remove a safe by those means briefly discussed above. A secondary objective is to reduce the degree of damage to the area surrounding such safes during any attempt to remove it.

According to a first aspect of the invention, a
20 security means comprises at least one anchor means for affixing to the ground or securing to a floor adjacent and below the location of a safe, a pivot means on said at least one anchor means, at least one elongate support means pivotally secured to said pivot means on the at least one
25 anchor means, said elongate support means to be attached to the safe. Preferably, the at least one elongate support means is provided with a pivotal connection to be secured to the safe.

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According to a second aspect of the present invention, a security means comprises at least one anchor means for affixing to the ground or securing to a floor adjacent and below the location of a safe, a pivot means on said at least one anchor means, at least one elongate support means pivotally secured to said pivot means, said at least one elongate support means lying telescopically within an outer encasing means to be secured to said safe, and there being means to prevent the detachment of the encasing means from the elongate support means. Preferably, the outer encasing means is provided with a pivot to be secured to the safe.

In the form of construction where one support means is provided, it is preferred to provide a second pivotal connection as between the elongate support means and the anchor means lying at substantially 90° to said pivotal securing of the elongate support means to said pivot means. However, two such security means may be provided, one to lie to either side of a safe and where the respective outer encasing means is secured to a respective side wall of said safe, where only a single pivotal connection is required as between each elongate support and its respective anchor means.

In its basic form of construction, and with a safe positioned in generally conventional manner with its related access door (night safe) or its respective cash dispensing mechanism, and with the anchor means suitably affixed to the floor either by embedding in the floor such as by way of reinforced concrete or secured to the floor such as by securing bolts or, and with a suspended floor, by the

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provision of an appropriate securing member below floor level, the ramming of the wall or the window by heavy equipment within the height of the safe causes a rearward movement of the safe about the pivot of the at least one elongate support means to its respective anchor means. As a result, the safe remains attached to the anchor means with the two-fold result that the safe cannot be readily gripped and removed by the equipment, and the controlled and predetermined direction of movement of the safe is such as to restrict and minimise damage internally of the building. In the opposite circumstance where the wall or window above the safe is attacked, and the heavy equipment used to pull the safe, again there is the pivotal movement of the elongate support about its pivot and attendant pivoting of the safe about the elongate support until the safe, still attached to the anchor, lies on the floor. Once in this position the thieves have the additional task confronting them of attempting to remove the support from the pivot or the safe from the support to which it is attached. By the careful selection of appropriate materials, considerable resistance to mechanical and flame cutting can be provided, giving time for security forces to arrive at the scene, or forcing the thieves to abandon the attempt to remove the safe.

In its preferred form of construction where the said at least one elongate support means lies telescopically within the outer encasing means, there is the first advantage of enabling the security means to be attached to the safe with the safe at the height required by the installation that it

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serves. There is the second and important advantage that if, during attack, the safe is pulled forwardly there is the sliding of the outer encasing means on the support means to the limits provided by the means preventing the detachment of the encasing means from the support means which results in the safe being brought clear of the building to lie on the floor outside the building and hence in full view.

Preferably, the or each security means has a box-like elongate support member provided with a commensurately box-like encasing means, with the or each box-like support being provided with a pivot pin to co-operate with a pivot housing secured, such as by welding, to a mounting plate, the mounting plate being attached to the anchor, such as by welding.

In its telescopic form of construction and to prevent the detachment of the encasing means from its support, the size relationship of the two box-like members is such as to provide a space between adjacent co-operating side walls to enable a first plate member to be provided secured towards the upper end of the support member and extend towards the co-operating face of the encasing means, and a second plate member to be provided secured towards the lower end of the side face of the encasing means and extend towards the co-operating side face of the support member, such that sliding of the encasing means on the support member in a direction to remove it from the support member results in a jamming action between the respective plate members to prevent the detachment of the encasing means from the support member. Whilst the elongate support means or the encasing means may be

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secured to the sides of the safe by welding, it is preferred to provide a pivotal connection. Thus, if the safe is pulled out to lay on the ground, any attempt to use the heavy equipment to twist the safe to break its connection to the encasement means, simply results in the safe pivoting about the pivotal connections to the support or the encasing means.

To provide additional security against internal damage to the building, at least one yieldable leg member can be provided, or alternatively two, one to either side of the innermost bottom edge of the safe and secured to the ground. Here, any direct attack over the height of a safe resulting in a rearward pivoting of the safe results in the legs yielding in controlled manner. In the other circumstance where the attack is above the safe and the safe pulled out of the building, thieves may attempt to break the safe free by ramming it directly with the heavy equipment attempting to push it back into the building to break it free from its anchor means. It is therefore desirable to provide spring-loaded detents located towards the upper end of the or each support member and co-operating recesses formed in opposite co-operating faces of the encasing means, towards the lower end. Thus, if the encasing means is moved in a direction to detach it from the support means, the spring-loaded detents are brought into register with the co-operating recesses to lock the encasing means to the supports. Alternatively, there may be provided, internally of the encasing means, a spring-loaded wedge member to co-operate with an internal face on the wall of the encasing member. Thus, any force applied to the

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safe attempting to pull the encasing means up the box-like supports causes the wedge member to pick-up on the said face to provide a progressively increasing resistance to movement of the encasing means with respect to the supports, whilst at the same time defending the pivotal connections between the supports and the anchors, and (when present) the pivotal connections between the safe and the encasement means against shock loading.

Several embodiments of the invention will now be described in greater detail, by way of example only, with reference to the accompanying drawings, in which:-

Figure 1 is a perspective view of a security means in accordance with the invention provided with one anchor means;

Figure 2 corresponds to Figure 1 but shows a security means with two anchor means;

Figure 3 is a sectional side elevation through a support means for employment in Figure 1 or Figure 2;

Figure 4 is a section on the line IV-IV of Figure 3;

Figure 5 is a sectional side elevation through an alternative support means for use in Figure 1 or Figure 2;

Figure 6 is a section on the line VI-VI of Figure 5;

Figure 7 is a sectional side elevation through a further alternative support means for use in Figure 1 or Figure 2; and

Figure 8 is a section on the line VIII-VIII of Figure 7.

As is illustrated in Figures 1 and 2 of the drawings, a security means for a safe 1 is formed by providing the safe

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with either a single anchor means 2 to one side (Figure 1) or two anchor means 2, one to each side (Figure 2), one or both of which is to be securely affixed to the ground, such as by security bolts 3 or by embedding in concrete. Upstanding from the or each anchor means 2 is a pivot location member 4 to which is pivotally secured an elongate support member 5 in telescopic engagement with an outer casing 6, which casing is pivotally attached to the safe. Thus, with the telescopic members provided with means to prevent their ready disconnection (as will be explained below), and with the safe for example installed behind such as a cash dispensing machine, any attack such as by what is currently generally referred to as "ram raiding" where heavy equipment, such as, for example, in the form of diggers or earth removing equipment, or lorries and chains, is used to attempt to knock or pull the safe from its mounting behind such as a cash dispenser, simply causes the pivoting of the safe about its connection to the outer encasing member 6 and the pivoting of the support member 5 about the anchor making it difficult to break the connection as between the safe and the security means and to cause delay to the thieves of a time scale that can substantially be guaranteed to be greater than the response time of law enforcement agencies in arriving at the scene of crime from the activation of alarms that are ordinarily attendant to installations such as cash dispensing equipment.

In one form of construction as is illustrated in Figures 3 and 4, it is the case of the provision of a single

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security means to one side of a safe. Here, the anchor means 2 has a pivot support member formed by an upstanding armoured leg 7 to which is attached a multiplate U-shaped member 8 by a substantial pivot pin 9 bridging the legs of the multiplate U-shaped member and extending through a hole in the upstanding leg, the whole assembly being secured together by welding, the closed end of the multiplate U-shaped member 8 embracing a pivot pin 10 secured between the opposite side plates of the inner support member 5. The multiplate U-shaped member 8 is formed by alternating plates of high tensile steel and austenitic stainless steel to provide considerable tensile strength and resistance to burning, such as by way of an oxyacetylene torch.

At the upper end of the outer encasing member 6, a pivot 11 is provided lying and secured within the encasing member and which extends through an opening in a respective side face for association with a mounting plate 12 for attachment to a safe. Desirably, the pivot 11 is formed from high tensile steel and the associated mounting plate formed from carbon manganese steel to provide combined strength and toughness. To provide a defence to attack by burning, a washer 13 of stainless steel is provided between the side face of the outer encasing member 6 and the plate 12. The pivot 11 lies within a housing 14 attached to a boss 15 secured between the walls of the outer encasing member 6, and the exposed upper surface of the boss is protected against attack by burning by the provision of an overlaying shell of stainless steel.

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Both of the support member and the encasing member are preferably formed from carbon manganese steel, and the outer encasing member may be overlaid by plates 17 of austenitic stainless steel, to provide combined strength and resistance to burning.

As a further defensive measure, the interior of the support member 5 may be filled with a concrete and fibre mix and whereby any attack by burning on an exposed section of the support member will not result in the destruction of the connection between the anchor and the safe.

There is provided towards the upper end of the inner support member two opposed detents 18, 19, outwardly spring-loaded by a spring 20, for the detents to bear against opposed walls of the encasing member. Towards the lower end of the encasing member is a first pair of opposed receiving holes 21 in opposed walls of the encasing member within the sector overlaid by the defence plates 17 secured externally of the outer encasing member 6. Preferably, and as shown, a second pair of receiving holes 22 is provided located below the receiving holes 21. The force of the spring 20 on the opposed detents is such as to provide a friction force as between the detents and the encasing member that resists free movement of the encasing member with respect to the support member, not sufficient to impede the positioning of the encasing member on the support member at a height required for a particular safe, but sufficient to assist in defending against shock loading of the pivotal connections during any attempt to pull the safe from the securing means. Any such movement during an attack

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on a safe causes a movement of the encasing member until such time as the detents are brought into register with the first pair of holes 21 when the spring 20 causes the detents to engage in the holes 21 and lock the encasing member against further movement. In the unlikely event that the detents override the first pair of holes the detents would then be brought into register with the second pair of holes 22. Secured towards the upper end of one face of the inner support member 5 is a wedge member 23, and secured to the lower end of the co-operating face of the outer encasing member 6 is a corresponding wedge member 24. Thus, and in the further, more unlikely event, that the detents override the second pair of holes or should the detents fail, the wedge members 23, 24, on the support member and the encasing member would be brought into register to jam against each other and prevent the removal of the encasing member from the support member.

It will readily be appreciated that in the event of attack there would be a pivoting of the support member about either or both of the pivots 9 and 10 securing it to the anchor means and a pivoting of the safe about the pivot 11 making extremely difficult the gripping, or holding, of the safe by such as earth moving equipment or chains and hence the breaking free of the safe from the security means for an appreciable period of time greater than the maximum response time for the police or other security services to reach the scene of crime.

In the embodiment shown in Figures 5 and 6, like reference numerals have been employed for simplicity. With

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this form of construction, there is the provision of two security means each attached to a respective opposite side of a safe and hence all that is required is a single pivot 9 attaching the lower end of the support member 5 to the upstanding armoured leg 7 secured to the anchor 2. Albeit that the security means in this form has but a single pivotal direction of the support member when under attack, the provision of two security means and their attachment to the safe by way of the mounting plate 12 and pivot 11, again results in a considerable security of connection of the safe to the security means and the consequent time that would be needed to destroy the connection between the safe and the security means.

With the constructions of Figures 3 to 6, the provision of opposed, spring-loaded detents facilitates the telescopic movement of the outer encasing member in relation to the inner support member 5, enabling relatively easy adjustment to suit the particular height of a particular safe to which the security means are to be attached. Where the height of a safe is known and reasonably guaranteed, it would be possible to substitute a jamming mechanism between the inner support and the outer encasing member for the spring-loaded detents. Thus, as is shown in Figures 7 and 8, a single leg form of construction corresponding to Figures 3 and 4, there is, towards the upper end of the inner member 5 a jamming mechanism in the form of an angled plate 25 extending across the inner member and through an opening in one side face, for the end of the angled plate to bear against the

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inner surface of the respective side face of the outer member, there being spring means 26 provided to load the angled plate in a downward direction. On first assembly of the encasing member on the support member, the encasing member can be
5 positioned at a required height with relative ease, and any attempt to pull the encasing member from the support member resisted by the angled plate contacting the inner surface of the respective side of the encasing member with increasing force, the greater is the force attempting to remove the
10 encasing member from the support. The contact between the angled plate and the inner surface of the encasing member does not totally prevent movement with respect to the support member, it provides a controlled resistance to movement to provide a defence against the imposition of shock loads on
15 either or both of the pivotal connection to the anchor means and pivotal connection to the safe. To prevent the detachment of the encasing member from the support member, respective wedge members 23, 24 are secured to the outer surface of the support member, towards its upper end, and to the inner
20 surface of the adjacent face of the encasing member towards its lower end. Thus, respective movement can take place between the encasing member and the support member until such time as the wedge members 23, 24 are brought into engagement to jam against each other and lock the encasing member against
25 further movement with respect to the support member.

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CLAIMS

1. A security means characterised by at least one anchor means (2) for affixing to the ground or securing to a floor adjacent and below the location of a safe (1), a pivot means (4) on said at least one anchor means, at least one elongate support means (5) pivotally secured to said pivot means (4) on the at least one anchor means, said elongate support means (5) to be attached to the safe (1).

2. A security means as in Claim 1, characterised in that the elongate support means (5) is provided with a pivotal connection (11, 12) to be attached to the safe (1).

3. A security means characterised by at least one anchor means (2) for affixing to the ground or securing to a floor adjacent and below the location of a safe (1), a pivot means (7, 9) on said at least one anchor means (2), at least one elongate support means (5) pivotally secured to said pivot means (9), said at least one elongate support means (5) lying telescopically within an outer encasing means (6) to be secured to said safe (1), and there being means (18, 19, 23, 24, 25) to prevent the detachment of the encasing means (6) from the elongate support means (5).

4. A security means as in Claim 3, characterised in that the outer encasing means (6) is provided with a pivotal connection (11, 12) for attachment to the safe (1).

5. A security means as in any of Claims 1 to 4, characterised in that one support means (5) is provided, there being a second pivotal connection (10) as between the elongate support means (5) and the anchor means (2) lying at

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substantially 90° to said pivotal securing (7, 9) of the elongate support means to said anchor means (2).

6. A security means as in any of Claims 1 to 4, characterised in that two such security means are provided, one to lie to either side of, and to be secured to, the safe.

7. A security means as in Claim 3, and Claims 4 to 6 when appended to Claim 3, characterised in that the or each security means has a box-like elongate support member (5) provided with a commensurately box-like encasing means (6), the or each box-like support member (5) being provided with a pivot pin (9) to co-operate with a mounting plate (7) attached to the anchor (2).

8. A security means as in Claim 3, and in Claims 4 to 7 when appended to Claim 3, characterised in that the size relationship of the two box-like members (5, 6) is such as to provide a space between adjacent co-operating side walls to enable a first plate member (23) to be provided secured towards the upper end of the support member (5) and extend towards the co-operating face of the encasing means (6), and a second plate member (24) to be provided secured towards the lower end of the side face of the encasing means (6) and extend towards the co-operating side face of the support member (5), such that sliding of the encasing means on the support member in a direction to remove it from the support member results in a jamming action between the respective plate members to prevent the detachment of the encasing means from the support member.

9. A security means as in any of Claims 1 to 8,

characterised in that at least one yieldable leg member is provided to be secured between the bottom edge of a safe and the ground or floor.

10. A security means as in Claim 3, or in Claims 4 to 9 when appended to Claim 3, characterised in that a spring-loaded wedge member (25) is provided on the support member (5) to co-operate with an internal face on the adjacent wall of the encasing means (6) whereby to resist a telescopic movement of the encasing means with the support member in a direction to remove the encasing means from the support member.

11. A security means as in Claim 3, or in Claims 4 to 9 when appended to Claim 3, characterised in that spring-loaded detents (18, 19) are provided located towards the upper end of the or each support member (5), and co-operating recesses (21) are formed in opposite co-operating faces of the encasing means (6) towards the lower end thereof.

12. A security means as in any of Claims 1 to 11, characterised in that the support means (5) and/or the outer encasing means (6) are provided with cladding plates (17) of a material to resist attack by burning.

13. A security means as in any of Claims 1 to 12, characterised in that the anchor means (2) is affixed to the ground or floor by security bolts (3).

14. A security means as in any of Claims 1 to 12, characterised in that the anchor means is embedded in the ground and encased by an appropriate concrete.

15. A security means substantially as hereinbefore described with reference to, respectively, Figure 1; Figure 2;

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Figures 3 and 4; Figures 5 and 6; and Figures 7 and 8 of the accompanying drawings.

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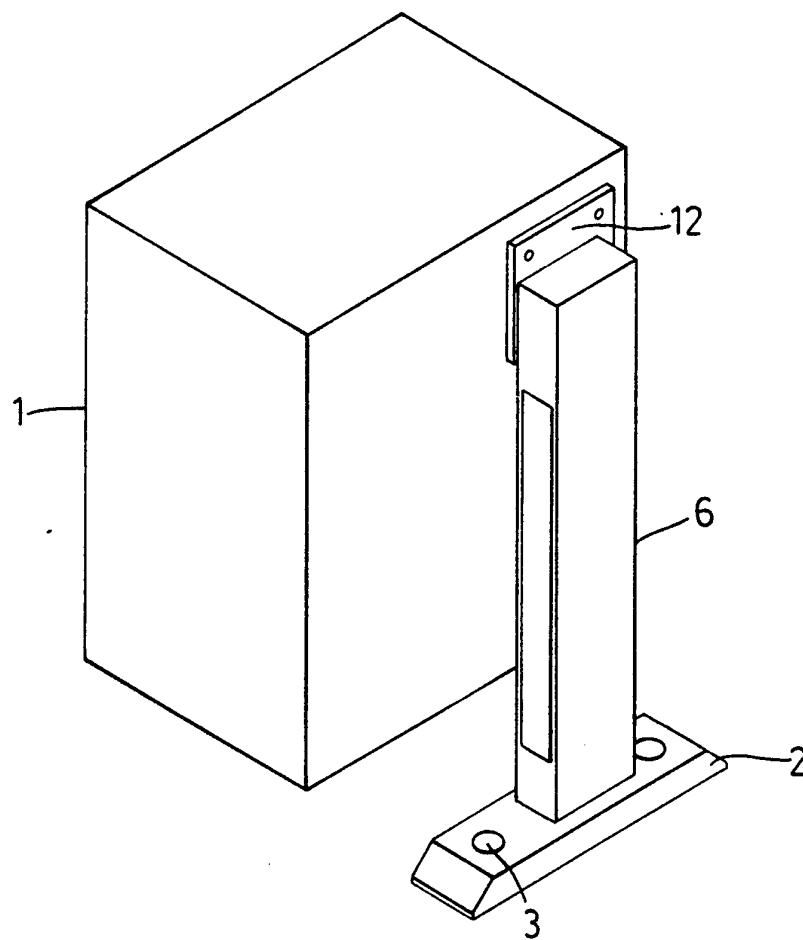


Fig. 1

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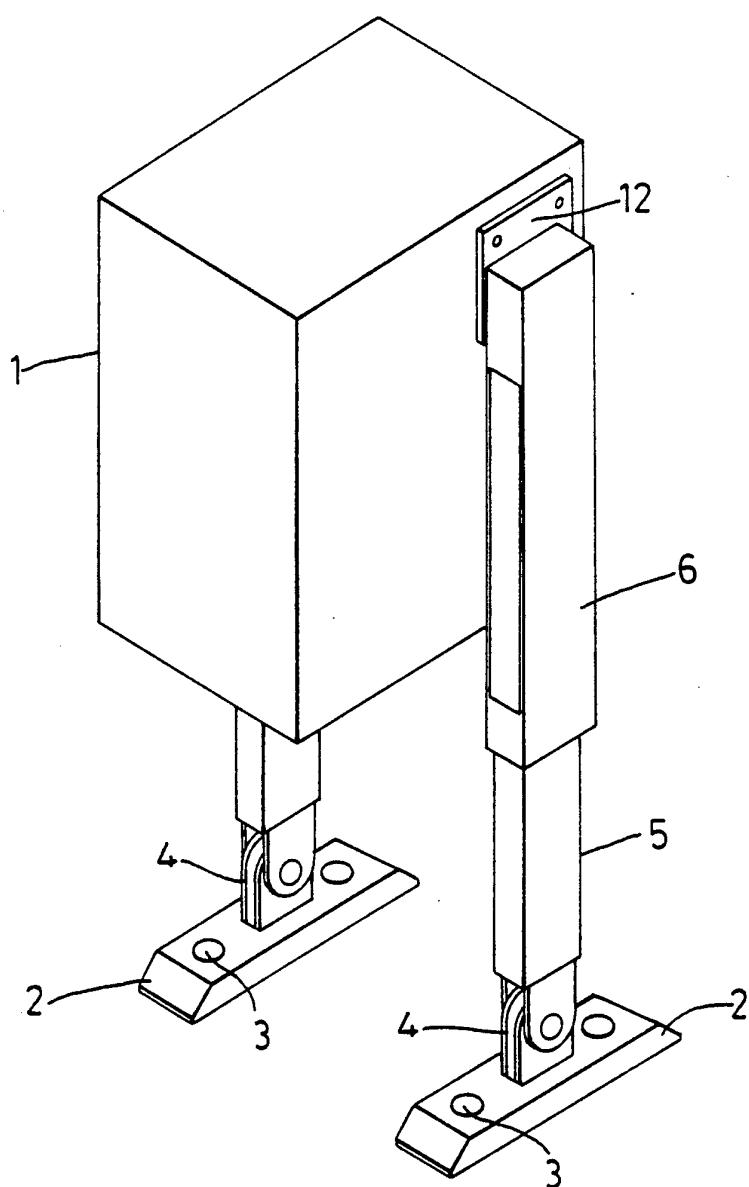


Fig. 2

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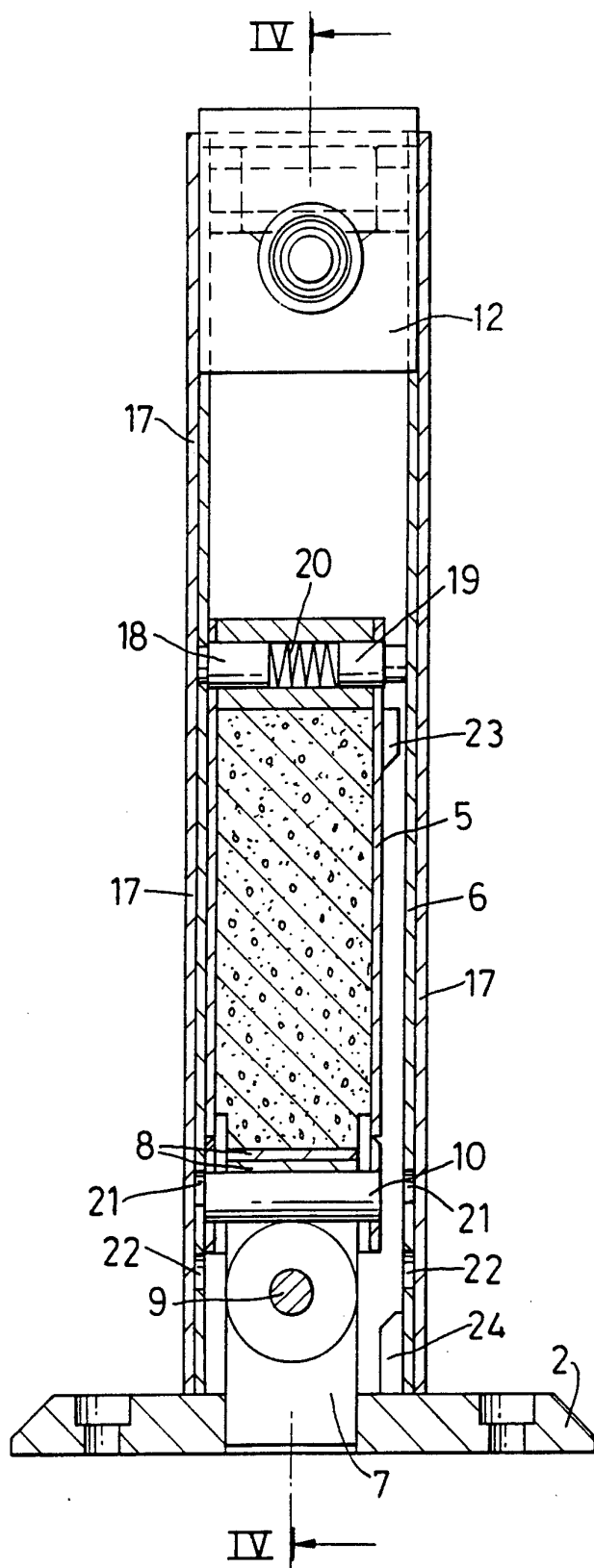


Fig. 3

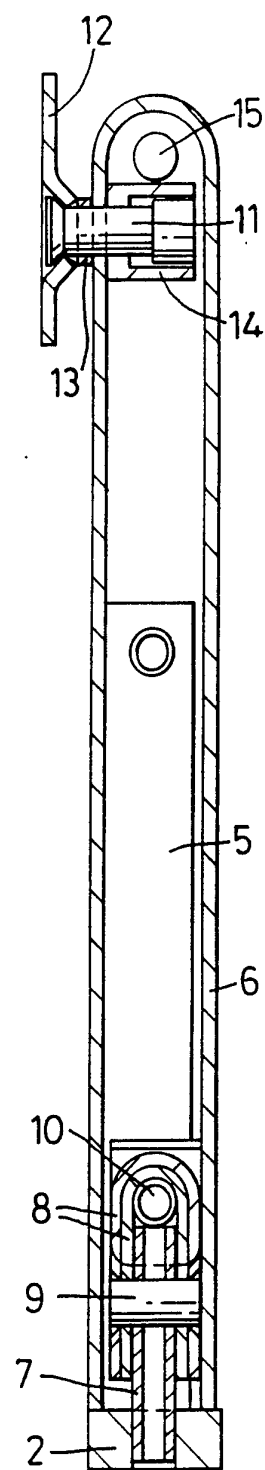


Fig. 4

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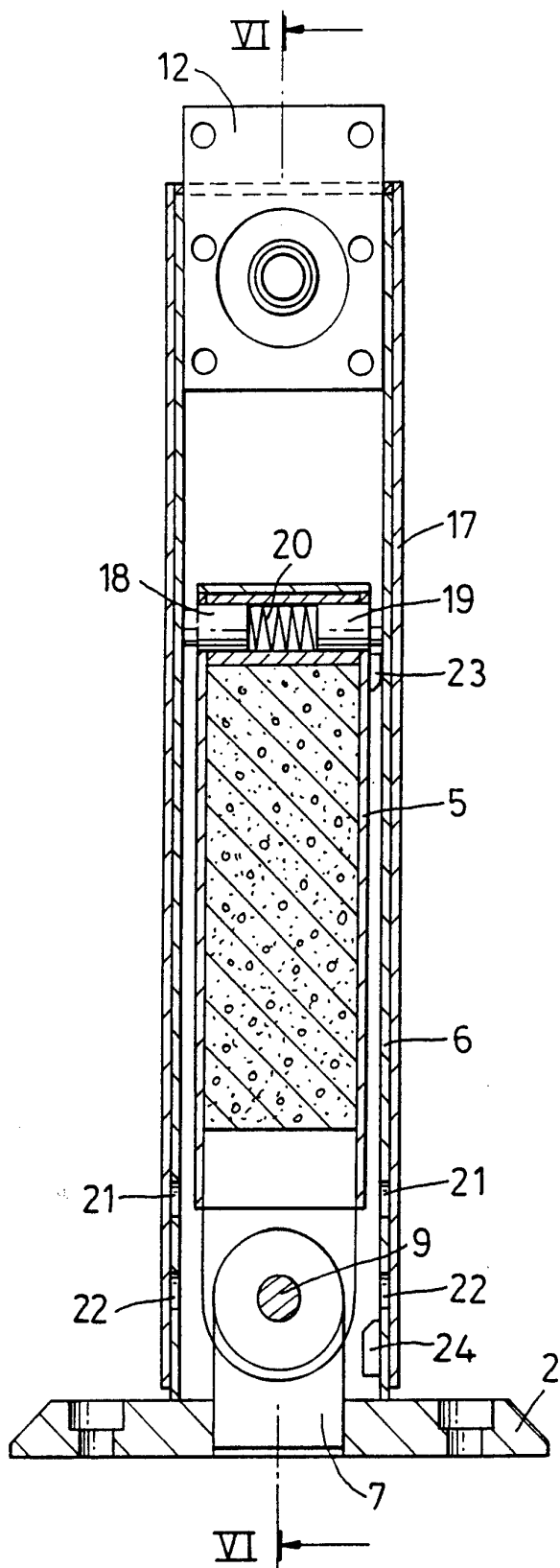


Fig. 5

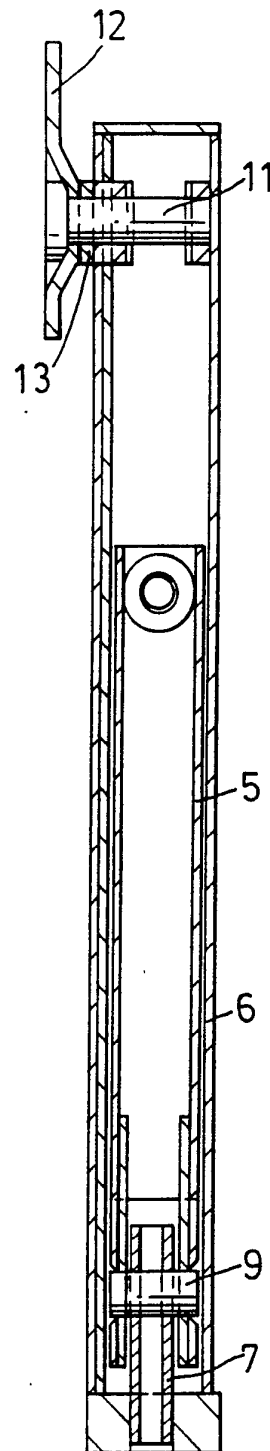


Fig. 6

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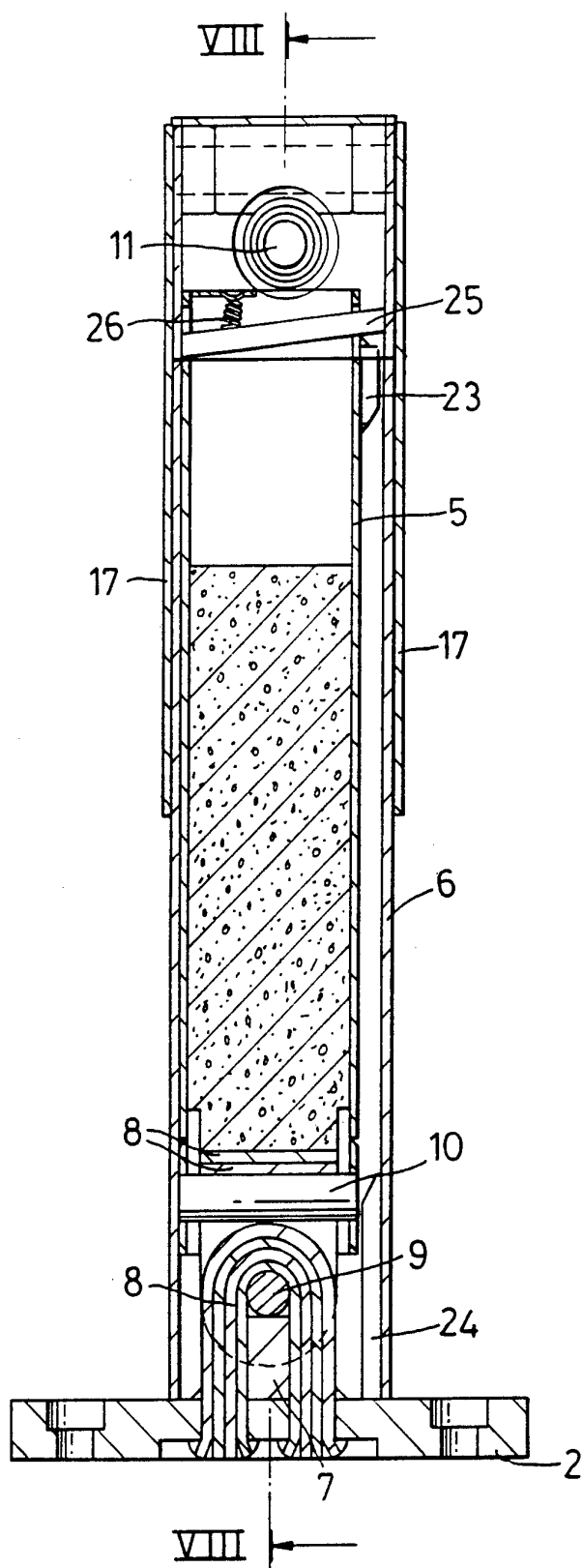


Fig. 7

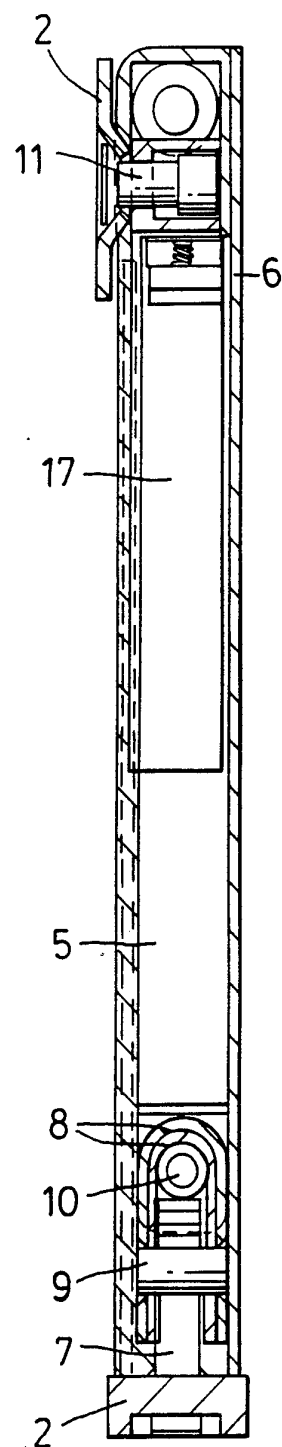


Fig. 8

INTERNATIONAL SEARCH REPORT

Intern al Application No

PCT/GB 93/02524

A. CLASSIFICATION OF SUBJECT MATTER
IPC 5 E05G1/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 5 E05G E05B E05D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	GB,A,2 224 769 (SALMEN) 20 April 1988 see page 2, line 4 - line 14; figures 1-4 ---	1,9,13 2-4,14
Y A	US,A,1 970 178 (MICHLUN) 14 August 1934 see page 1, line 28 - page 2, line 3; figures 1-3 ---	2-4 7
Y	US,A,1 802 375 (CRAMER) 28 April 1931 see page 1, line 77 - line 81; figure 1 -----	14

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 93/02524

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