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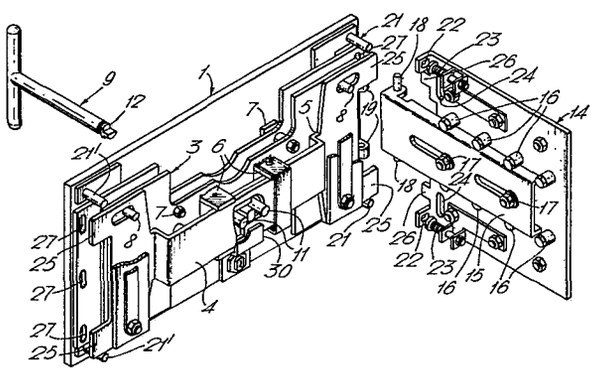
(54) Security mechanisms.

(57) A secure locking mechanism for coin boxes is operated by a tommy bar. Hinges on the coin box housing door are spring loaded so that the door is pushed back over the housing prior to locking. When the door is pushed back shaped sections (26) of lock side plates (14) engage with corresponding apertures (27) in a fixed front plate. When the tommy bar is rotated shaped sections (25) of plates slideably attached to the front plate engage with corresponding apertures (24) in the side plates so that the plates are "knitted" together. A key operated plate (29) closes an aperture in the front of the housing when the tommy bar is removed and also prevents the levers of the mechanism from being turned.



EP 0 057 318 A1

The present invention relates to security mechanism and in particular, but not exclusively, to such mechanisms for securing access panels or doors in housings containing coin collecting apparatus.

Of the problems facing telephone authorities, vandalism of, and theft from, telephone apparatus installed in public telephone booths are costly and cause much inconvenience to persons wishing to use the apparatus.

It will be appreciated that in addition to revenue lost by direct theft from cash boxes associated with the telephone apparatus, additional revenue and customer goodwill may be lost as the result of damage rendering the apparatus unuseable. Any damage to the apparatus may be expensive to repair and may result in the apparatus being left in an unuseable condition for a considerable period while spare parts or complete replacement apparatus are obtained.

Particularly where the telephone apparatus is in a remote location an unuseable telephone booth may result in a delay in contacting emergency services (fire, police, ambulance and the like) which can result in severe loss to members of the public.

One of the more common methods of obtaining entry to the cash box and/or coin collecting mechanisms of telephone apparatus is to prise open doors in the housing which are provided to enable authorised removal of collected coins and/or servicing of the apparatus.

If simple locking mechanisms are used they are easily defeated by crooks and vandals. More complicated locking mechanisms which may be provided to make access by unauthorised persons difficult also make access by authorised persons more time consuming and are themselves expensive to provide.

It is an object of the present invention to provide a relatively inexpensive security mechanism which is simple to operate by authorised persons but difficult to defeat by unauthorised persons.

The term 'access panel' as used hereinafter includes doors and plates whose purpose is to close or cover openings in casings.

According to one aspect of the present invention a security mechanism for releasably securing an access panel in a casing comprises a plurality of moveable members which are adapted to co-operate with means associated with the casing to hold the panel to the casing, detachable operating means which is arranged to pass through an aperture in the access panel to co-operate with said plurality of moveable members and which is manually operable to cause the members to move from a primary position in which the members co-operate with said means associated with the casing to prevent the access panel being removed to a secondary position in which the members are free from the casing to enable the access panel to be removed, or to move from said secondary position to said primary position, and key operated means manually operable to cause blocking means to move from a first position in which it constitutes a barrier to prevent said detachable operating means from co-operating with said plurality of members to a second position in which said detachable operating means may co-operate with the plurality of members, or from said second position to said first position.

Preferably said blocking means is also arranged in said first position to prevent movement of said plurality of members from said primary position to said secondary position.

Said detachable operating means may be a 'T' bar having a partially squared operating end which is arranged to cooperate with a correspondingly shaped aperture in rotatable actuating means to which said plurality of members are connected.

The detachable op rating means may also be arranged to cooperate with the members in the secondary position so as to form a handle to assist the opening or closing of the access panel.

In one embodiment the plurality of moveable members are adapted to cooperate with respective apertures in respective plates which are arranged to be attached to a casing.

In an alternative embodiment the moveable members include apertures which are adapted to cooperate with spigots associated with a casing.

Said blocking means may be key operated or may be operable by means of a signal received over a line.

The invention is featured in a housing for coin-collecting telephone apparatus comprising a case divided into upper and lower sections, the upper section being arranged to hold the coin collecting mechanism, the lower section being arranged to hold storage for collected coins, and each of the sections having a respective access panel equipped with a respective security mechanism in accordance with the invention.

According to a feature of the invention a security mechanism includes an elongate fixed member having a plurality of apertures spaced apart therein, a plurality of fixed members each having a plurality of tongues each tongue being arranged to cooperate with a corresponding aperture in said elongate member when an access panel to which the elongate member is attached is inserted in a casing to which the first plurality of members are attached, and a plurality of moveable members

connected to the elongate member and each of said second plurality of members has a respective plurality of tongues, each tongue being arranged under manual operation to cooperate with a corresponding aperture in one of the plurality of fixed members so as to substantially prevent movement of the access panel in any direction.

Security mechanisms in accordance with the invention will now be described with reference to the accompanying drawings of which:-

Figure 1 shows a security mechanism in accordance with the invention,

Figures 2 and 3 respectively show a part of the mechanism of Figure 1 in the closed and open positions,

Figure 4 shows a feature of Figure 1 in greater detail,

Figure 5 is a side elevation of another security mechanism in accordance with the invention,

Figure 6 is a rear elevation of the mechanism of Figure 5,

Figures 7 and 8 respectively, show a shutter mechanism of Figure 5 in the open and closed position, and

Figure 9 is a front elevation of a housing incorporating the security mechanisms of Figures 1 and 5.

Referring to Figures 1, 2, 3 and 4, and particularly to Figure 1 the security mechanism is shown attached to a panel 1 which may be an access door in the cash compartment of a coin collecting telephone housing (Figure 9).

The mechanism comprises a fixed front plate 2 which is securely attached to the panel 1 by studs 7 the heads of which hold the front plate 2 away from the panel 1, a mounting plate 3 separated from the front plate 2 and also attached to the panel 1 by the studs 7, and two sliding plates 4 and 5 carried between

bearers 6 which are pressed out sections of the mounting plate 3 and slideable on spigots 8.

An operating arm 9 which is detachably engageable with a rotatable actuating disc 10 arranged such that spigots 11 cause the sliding plates 4 and 5 to move in opposing directions when the actuating disc 10 is rotated by manual operation of the operating arm 9. The operating arm 9 includes a shoulder 12 which is arranged to pass through a similarly shaped aperture in the front plate 2 such that when the operating arm 9 is rotated through 90 degrees to cause the slide plates 4 and 5 to move from the locked position (slide plates fully extended) to the unlocked position (slide plates fully retracted) the longer sides of the shoulder 12 turn behind the edges of the aperture in the front plate 2 enabling the operating arm 9 to be used as a handle to assist opening of the panel 1. A disc plate 13 having a cut away section rotates with the actuating disc 10 and cooperates with a pin (not shown) extending between the plates 2 and 3 to prevent the operating arm 9 from being rotated beyond the fully extended or fully retracted positions of the slide plates 4 and 5.

The action of the security mechanism will be more readily understood if the mounting of the panel 1 with respect to a casing is first considered.

It will be appreciated that the panel 1 will be more difficult to remove if the edges of the panel when fitted and closed are within the confines of the casing. Therefore this type of mounting is shown in Figure 1 and comprises a back plate 14 having a slideable member 15 held to the back plate 14 by nuts and studs 17 and supported by a number of rollers 16. Provision is made for the back plate 14 to be attached to the inside of a casing (not shown). The slideable member 15 has a pair of hinge pins 18 attached thereto and arranged to receive a pair of brackets 19 which are attached to the front

plate 2. Thus the panel 1 may be either swung open or completely removed from the casing when the sliding plates 4 and 5 are retracted. To close the panel 1 the brackets 19 must first be fitted over the hinge pins 18 and the panel 1 be rotated so that the panel 1 lies in a plane approximately at right angles to the back plate 14. The panel 1 may now be pushed back within the casing with the slideable member 15 assisting primary location of the panel 1.

So that the panel 1 is correctly aligned with respect to the security mechanism two locating pegs 21 are provided each of which enters a respective aperture 22 in the back plate 14. When the panel 1 is correctly located with respect to the casing it may be pushed 'home' against the pressure of spring loaded buffers 23 which are provided to assist the opening of the panel 1.

Referring again to Figure 4 a part of a back plate 14' for attachment to the opposite side of the casing to that to which the back plate 14 is fitted may be seen. The back plate 14' also has apertures corresponding to the apertures 22 into which two locating pegs 21' fit when the panel 1 is pushed into position in the casing. Equivalent spring loaded buffers (not shown)to the spring loaded buffers 23 may also be provided.

It is convenient to describe only the interaction of the back plate 14', the front plate 2 and the slide plate 4. It is noted here that the back plate 14, the front plate 2 and the slide plate 5 interact in a similar manner at the other end of the slide plate 2.

The back plate 14' includes two apertures 24 arranged to receive respective tongues 25 of the slide plate 4 when the mechanism is locked. The back plate 14' also has three tongues 26 respectively arranged to enter apertures 27 in the front plate 2 when the panel 1

is pushed in towards the casing. Thus when the panel 1 is in the correct position and the slide plates4 and 5 are operated to cause the respective tongues 25 to enter the respective apertures 24 a corner of some strength is provided.

Having considered the security mechanism for locking the panel 1 to the casing it is necessary to consider sealing of the aperture in the panel 1 through which the operating arm 9 passes.

Referring particularly to Figures 2 and 3, a cylinder lock 28 of known kind is provided which is arranged to rotate a shutter plate 29 and a blocking plate 30.

When the lock 28 is turned to close the aperture, the shutter plate 29 turns between the panel 1 and the front plate 2 to cover the aperture and prevent the operating arm 9 from being inserted. It will be appreciated that the shutter plate 29 being supported between the panel 1 and the front plate 2 reduces the possibility of the plate being damaged or broken by use of a hammer and chisel for example.

As an added precaution, in case unofficial access to the mechanism is obtained, say by a hole being drilled through the shutter plate, the blocking plate 30 is arranged to cooperate with the spigots 11 to prevent the actuating plate 10 from rotating when the lock 28 is in the closed position thus preventing the slide plates 4 and 5 from being retracted.

Referring now to Figures 5 and 6 in which parts having a similar function to those in the security mechanism previously described are similarly designated, the security mechanism in accordance with the inventiom comprises two slideable levers 31 having a number of apertures 32 (only two of which are shown) per slideable lever 31 engageable with respective spigots 33 which are attached to the side members of a casing

(not shown). The slideable levers 31 are mounted on pins 34 which pass through respective guides 35 and may be held in place by a respective circlip 36. It will be appreciated that more than two pins 34 with corresponding guides 35 may be provided for additional support and security.

The slideable levers 31 move between the open and closed positions under control of linked control members 37 and 37' pivotally attached in apertures 38 to the slideable levers 31 which move about respective pivots 49.

The control members 37 and 37' are linked together by a pin 39 in the control member 37 which is slideable in a channel 40 of the control member 37' so that they are free to move from the closed position (shown by solid lines in Figure 6) to the open position (shown by dashed lines).

The control member 37 is connected to an operating arm 41 (similarly shown by solid lines in the closed position and dashed lines in the open position in Figure 6) to a rotateable plate 42 manually operable by the operating arm 9 to cause the slideable levers 31 to move between the open and closed position.

Referring also to Figures 7 and 8 the shutter plate 29 and the cylinder lock 28 are used to seal the entry aperture in the panel in the same manner as previously described with reference to Figures 1 to 4. In the present lock a blocking plate 44 is provided which is arranged to prevent the rotateable plate 42 from being rotated when the cylinder lock 28 is closed. The shutter plate 29 is again supported between the front panel 1 and a mounting plate 43 to prevent the shutter plate 29 being forced backwards.

Referring now to Figure 9 the housing, which is particularly but not specifically suited to housing coin collecting telephone apparatus has two access

panels 45 and 46 having respectively the security mechanisms of Figures 1 and 5. The housing is divided into two sections by a reinforcing plate 47 and the lower section may suitably include similar reinforcing at the sides and across the bottom of the housing. The access panel 45 is arranged to fit within the confines of the housing (as previously described) and a coin storage box may be fitted behind the access panel 45 in the lower section of the housing.

The upper section of the housing may contain the coin collecting mechanism such that coins inserted by way of a coin entry slot 48 pass through the coin collecting mechanism and through an aperture in the reinforcing plate 47 into the coin storage box.

It will be appreciated that the respective cylinder locks 28 of the two panels 45 and 46 may be operable by the same key or by different keys if it is desired to prevent maintenance personel having access to the coin box or to prevent cash collection personel having access to the coin collecting mechanism.

The cylinder locks may be of the kind in which the key is arranged to be removeable from the lock only when the lock is in the closed position. This kind of lock may be employed to ensure that authorised personel do not forget to operate the lock to close the aperture after removing the operating handle.

It will also be realised that other means of moving the shutter plate 29 may be used. For example if the housing is being used with telephone apparatus the shutter plate 29 and blocking means may be electromechanically opened in response to a signal received over a line from the exchange. Such a signal may be manually provided by action of an operator or may be automatically provided by an exchange in response to a specifically dialled code.

Claims

1. A security mechanism for releasably securing an access panel in a casing comprising a plurality of moveable members which are adapted to co-operate with means associated with the casing to hold the panel to the casing, detachable operating means which is arranged to pass through an aperture in the access panel to co-operate with said plurality of moveable members and which is manually operable to cause the members to move from a primary position in which the members co-operate with said means associated with the casing to prevent the access panel being removed to a secondary position in which the members are free from the casing to enable the access panel to be removed, or to move from said secondary position to said primary position, and means operable to cause blocking means to move from a first position in which it constitutes a barrier to prevent said detachable operating means from co-operating with said plurality of members to a second position in which said detachable operating means may co-operate with the plurality of members, or from said second position to said first position.

2. A security mechanism as claimed in Claim 1 in which said means operable to cause said blocking means to move is a key operated means manually operable to cause said blocking means to move between said first and second positions.

3. A security mechanism as claimed in Claim 1 in which said means operable to cause said blocking means to move is operable in response to signals received over a line from a remote location.

4. A security mechanism as claimed in any one of Claims 1 to 3 in which said blocking means is also arranged in said first position to prevent movement of said plurality of members from said primary position to said secondary position.

5. A security mechanism as claimed in any preceding Claim in which said detachable operating means comprises a 'T' shaped member having a partially squared operating end which is arranged to co-operate with a correspondingly shaped aperture in rotateable actuating means to which said plurality of members are connected.

6. A security mechanism as claimed in any preceding Claim in which said detachable operating means is arranged to co-operate with said members in said secondary position to provide a handle to assist the opening or closing of an access panel to which the mechanism is attached.

7. A security mechanism as claimed in any preceding Claim in which said plurality of moveable members are adapted to co-operate with respective apertures in respective plates which are adapted for attachment to a casing.

8. A security mechanism as claimed in any one of Claims 1 to 6 in which said moveable members include apertures adapted to co-operate with respective spigots associated with a casing.

9. A security mechanism including an elongate fixed member having a plurality of apertures spaced apart therein, a plurality 30 of fixed members each having a plurality of tongues each tongue being arranged to co-operate with a corresponding aperture in said elongate member when an access panel to which the elongate member is attached is inserted in a casing to which the first plurality of members are attached, and a plurality of moveable members connected to the elongate member and each of said second plurality of members has a respective plurality of tongues, each tongue being arranged under manual operation to co-operate with a corresponding aperture in one of the plurality of fixed members so as to substantially prevent movement of the access panel in any direction.

10. A security mechanism substantially as hereinbefore described with reference to Figures 1 to 4 of the accompanying drawings.

11. A security mechanism substantially as hereinbefore described with reference to Figures 5 to 8 of the accompanying drawings.

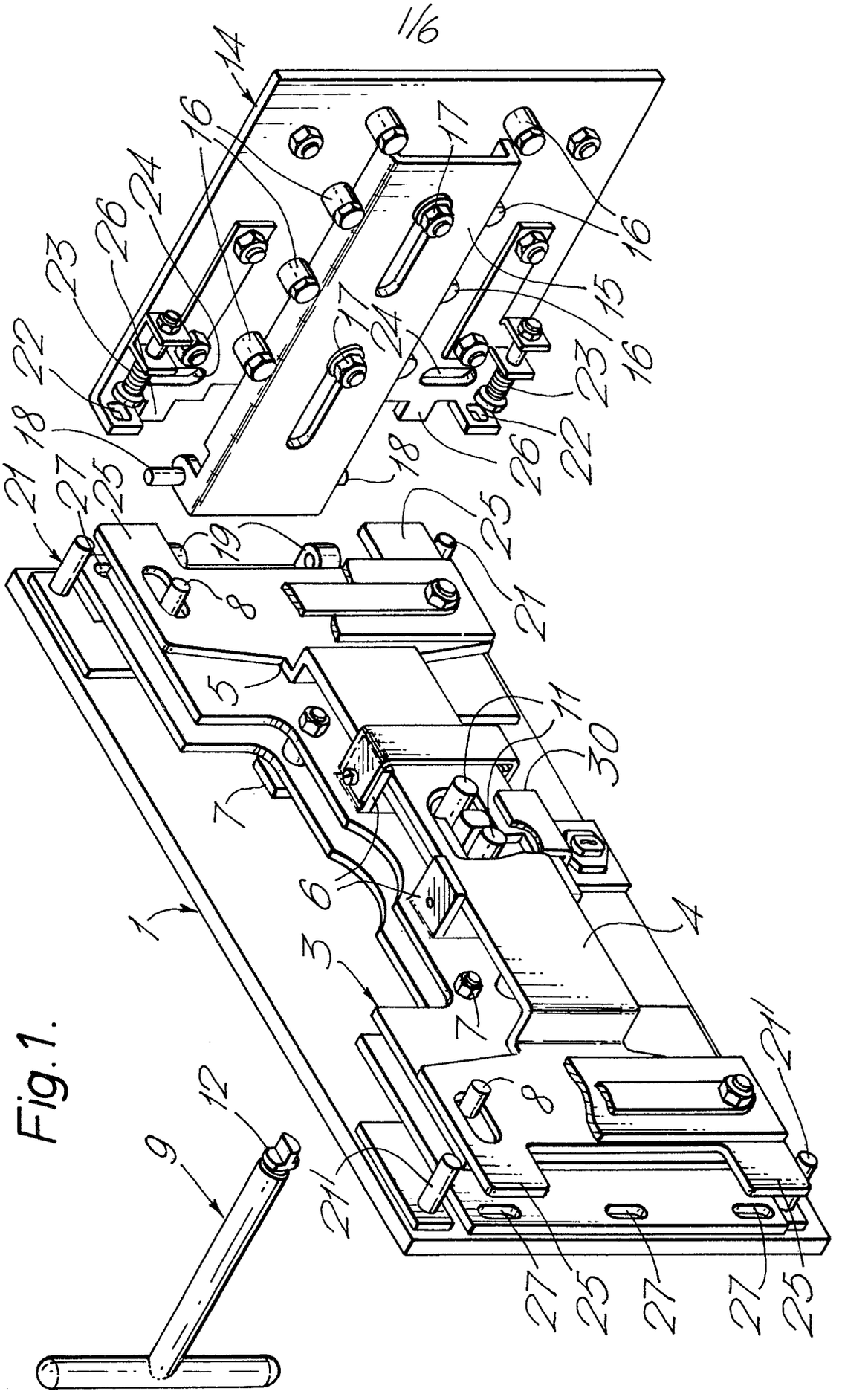


Fig. 1.

Fig.2.

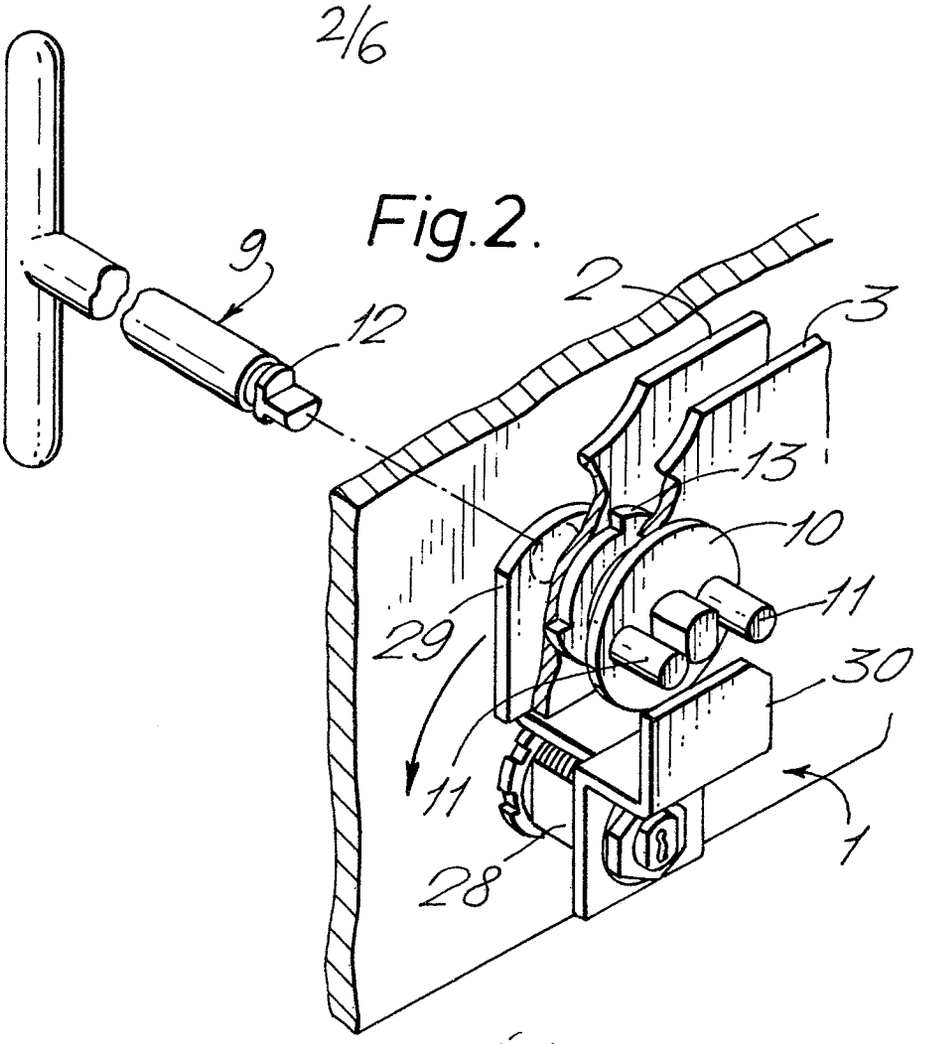


Fig.3.

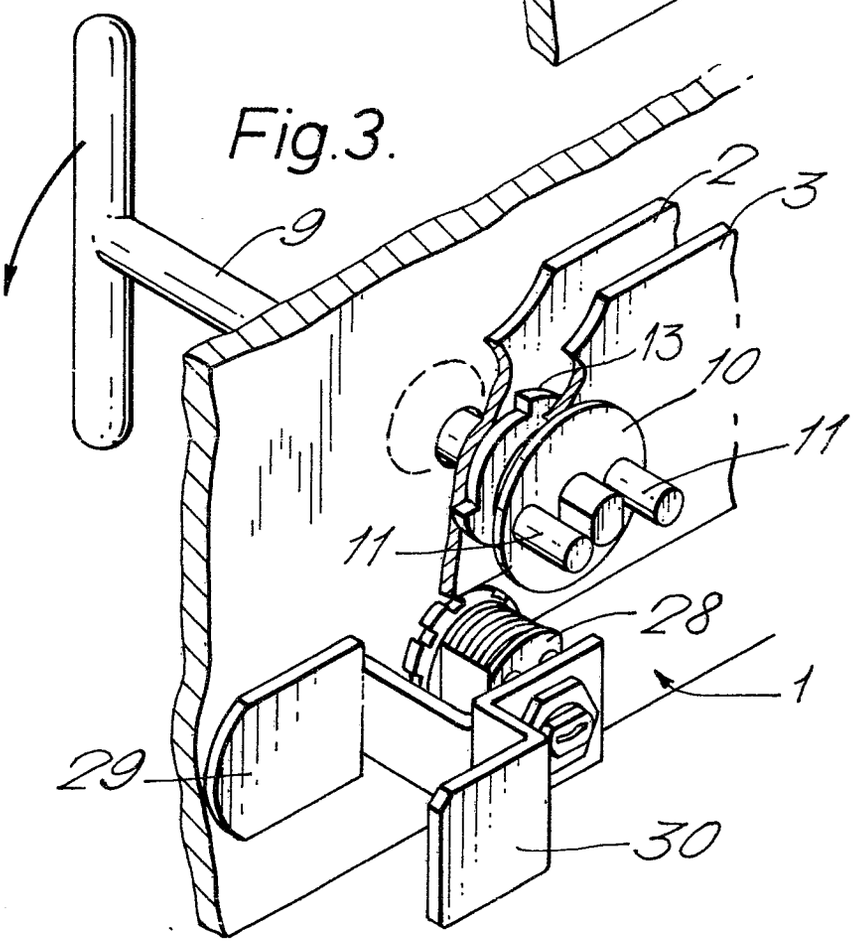


Fig.4.

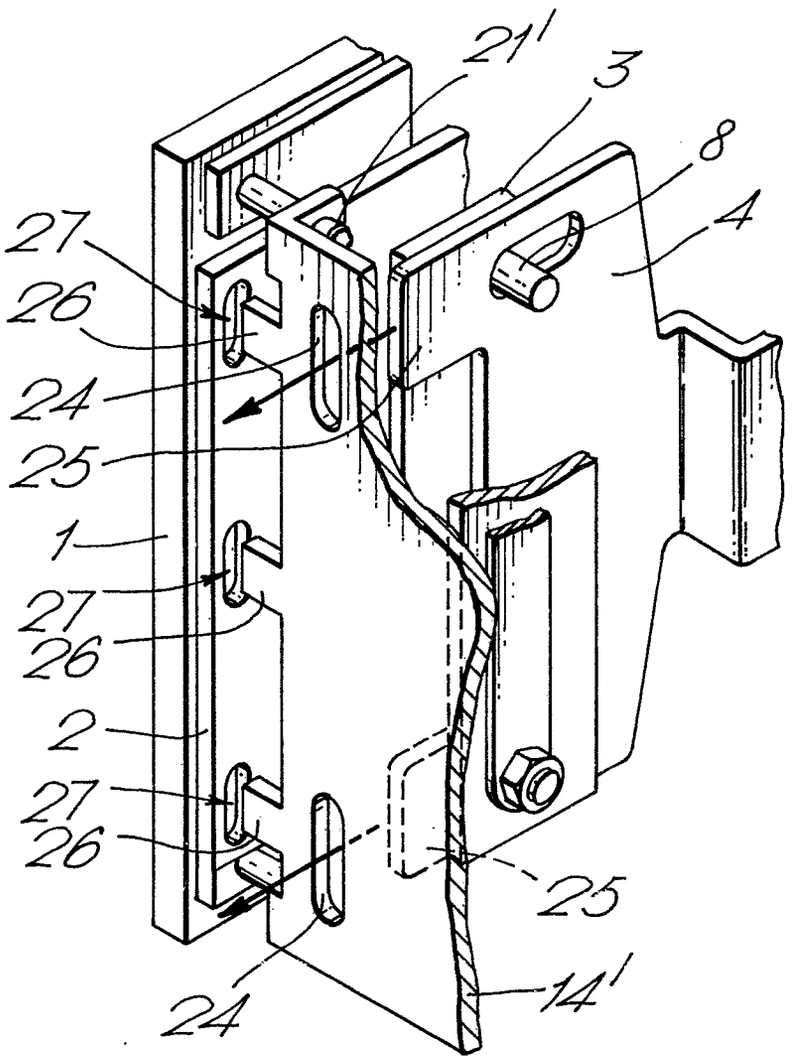


Fig.5.

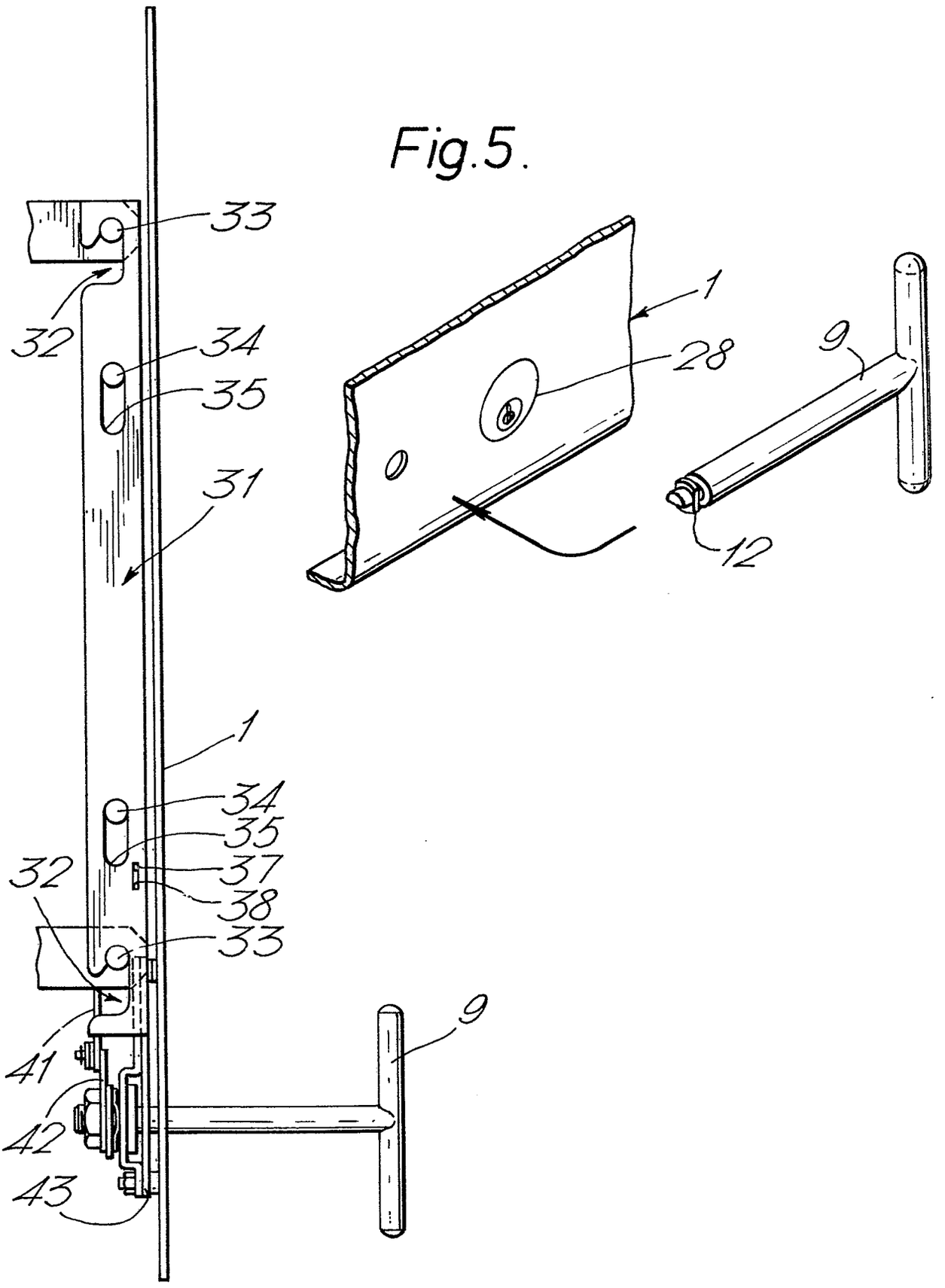


Fig.6.

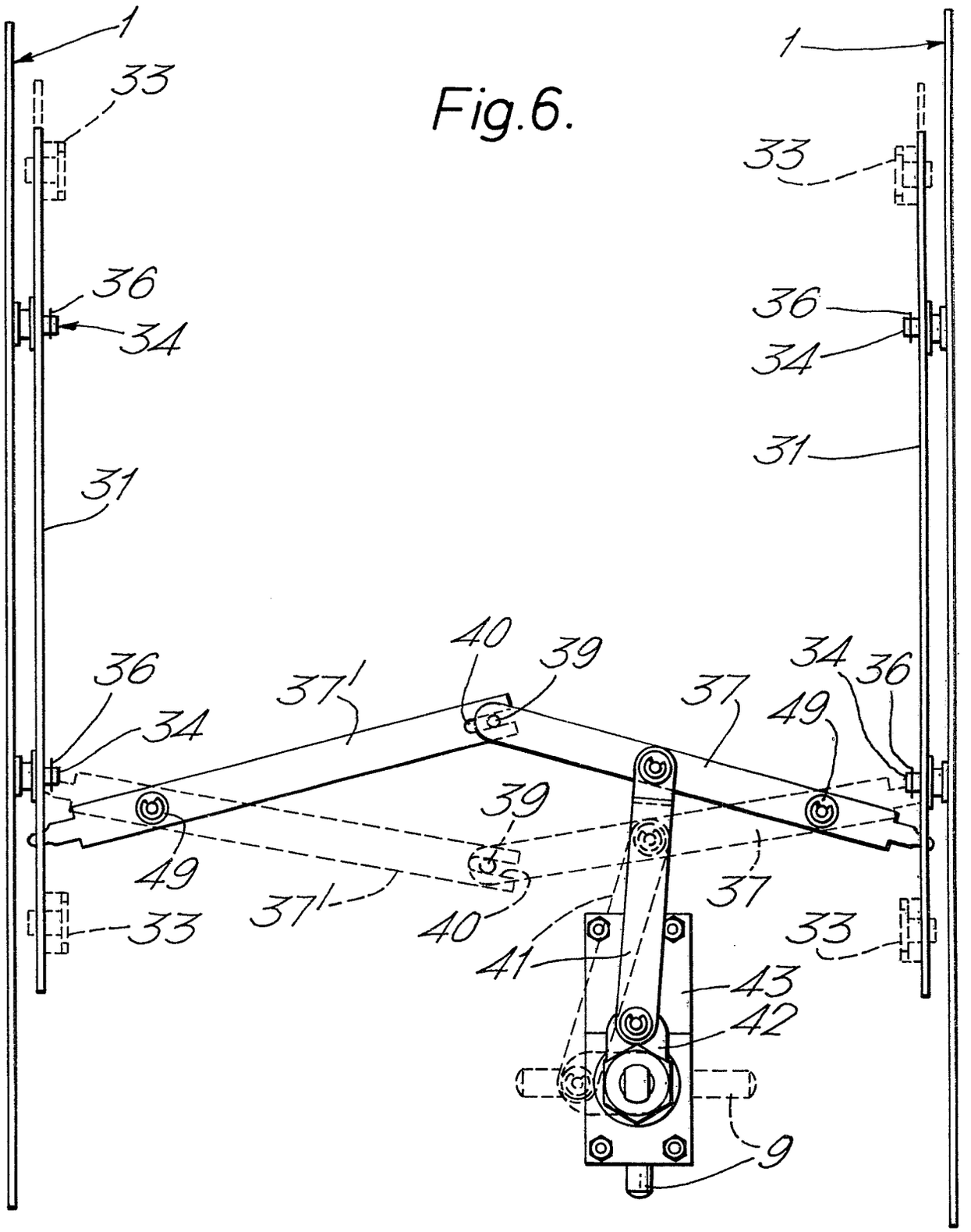


Fig.7.

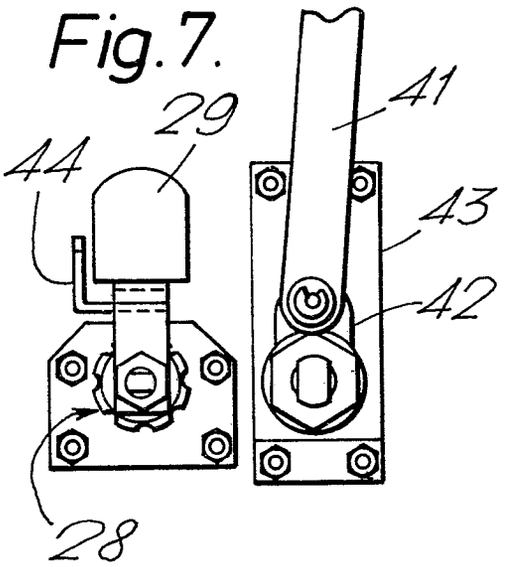


Fig.8.

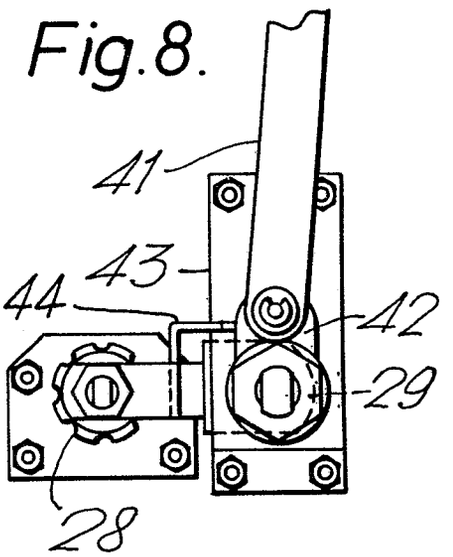
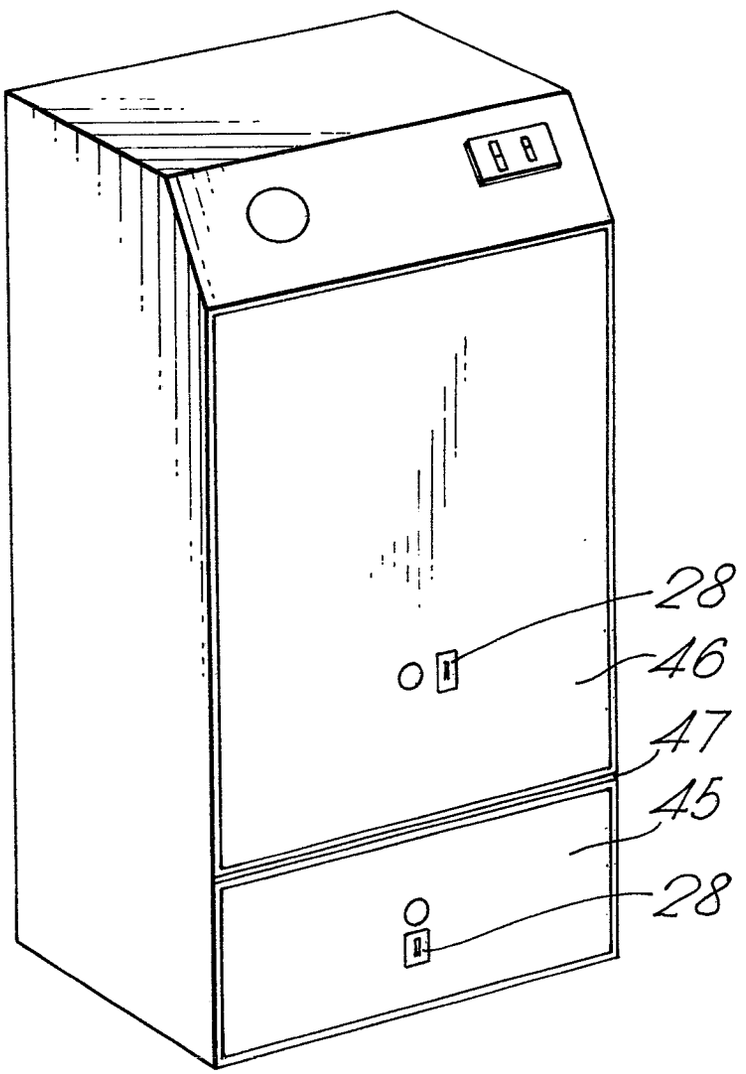


Fig.9.



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EUROPEAN SEARCH REPORT

Application number
0057318
EP 81 30 5728

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim
A	US - A - 3 538 724 (DAUENBAUCH)	
A	FR - A - 970 002 (DEGRENNE)	
A	DE - C - 0 002 894 (LEMKE)	

CLASSIFICATION OF THE APPLICATION (Int. Cl. 3)

E 05 B 65/00
17/14
63/14

TECHNICAL FIELDS SEARCHED (Int.Cl. 3)

E 05 B
E 05 C

CATEGORY OF CITED DOCUMENTS

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E: earlier patent document, but published on, or after the filing date
D: document cited in the application
L: document cited for other reasons

&: member of the same patent family, corresponding document

X The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	15-04-1982	VAN BOGAERT

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