609497

COMMONWEALTH OF AUSTRALIA

Patents Act 1952

APPLICATION FOR A STANDARD PATENT

We, ANTHONY ROBERT CAMPBELL, of Woods Road, Craven, New South Wales 2422, Australia, and WILLIAM ALAN CAMPBELL, of 35 Elliot Street, Gloucester, New South Wales 2422, Australia, hereby apply for the grant of a standard patent for an invention entitled:

ROLLER DOORS AND SHUTTERS

which is described in the accompanying provisional specification.

Our address for service is:

Halford & Maxwell
Patent & Trade Mark Attorneys
Level 20, National Mutual Centre
44 Market Street
SYDNEY NSW 2000

Dated this 17th day of July 1987.

ANTHONY ROBERT CAMPBELL and
WILLIAM ALAN CAMPBELL
by their Patent Attorneys
HALFORD & MAXWELL

To: Commissioner of Patents
Fee: $60.00
File: P 87 075

APPLICATION ACCEPTED AND AMENDMENTS ALLOWED 11.2.91

LODGED AT SUB-OFFICE
17 JUL 1987
Sydney

NON-CONVENTION.
One or more persons.

FORM 7

COMMONWEALTH OF AUSTRALIA
Patents Act 1952

DECLARATION IN SUPPORT OF A [redacted] APPLICATION FOR A PATENT OR PATENT OF ADDITION

(1) Here insert (in full) Name of Applicant or Applicants.

In support of the Application made by (1) ANTHONY ROBERT CAMPBELL AND WILLIAM ALAN CAMPBELL

for a patent ..... for an invention entitled. (2) Roller Doors and Shutters

(3) Here insert (in full) Address or Addresses.

~~I~~ We (1) ANTHONY ROBERT CAMPBELL AND WILLIAM ALAN CAMPBELL
of (3) WOODS ROAD, CRAVEN NSW 2422 and
35 ELLIOT STREET, GLOUCESTER NSW 2422
respectively

do solemnly and sincerely declare as follows:

1. ~~I am~~ We are the applicant for the patent
2. ~~I am~~ We are the actual inventor(s) of the invention.

(4) Here insert full Name(s) and Address(es) of Actual Inventor(s) if other than Applicant.

2. (4) .....

is/are the actual inventor(s) of the invention, and the facts upon which I am / We are entitled to make the application, are as follows:

(5) Full Name of Actual Inventor or Inventors.

I am / We are the assignee of the said (5) .....

DECLARED at Gloucester

this 22nd day of May 1990

(6) Signature of Applicant or Applicants.

(6) A R Campbell
(ANTHONY ROBERT CAMPBELL)

(WILLIAM ALAN CAMPBELL)

To:

THE COMMISSIONER OF PATENTS.

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(19) AUSTRALIAN PATENT OFFICE (10) Acceptance No. 609497

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ROLLER DOORS AND SHUTTERS

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(56) Prior Art Documents
AU 234078 38700/58 E06B 9/12
AU 206592 7060/55 E06B 9/14

(57) Claim

1. A retractable door including a curtain member moveable horizontally across an opening, attached at one end to and able to be wound about a drum member, the drum member having an axle vertically disposed in use parallel at least one substantially vertical side of said opening, said drum member being secured to a tensioning means to tension said curtain member and tending to wind said curtain member about said drum member, said tensioning means being counterbalanced by weight means attached to said curtain member.

5. A retractable door as claimed in claim 4 when appended to claim 3 wherein said upper track has a square U-shaped cross section formed from inwardly opposed lips extending horizontally from vertical side walls spaced by a horizontal web; said belt being located within and guided by said upper track by supports attached to each of said weights, said weights being spaced along said belt with said supports guided upon said lips.

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Form 10

PATENTS ACT 1952

COMPLETE SPECIFICATION

(ORIGINAL)

FOR OFFICE USE

Short Title:

Int. Cl:

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Lodged:

Complete Specification—Lodged:
Accepted:
Lapsed:
Published:

Priority:

Related Art:

TO BE COMPLETED BY APPLICANT

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Complete Specification for the invention entitled:

ROLLER DOORS AND SHUTTERS

The following statement is a full description of this invention, including the best method of performing it known to me:—

14599/78

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This invention relates to retractable doors and shutters particularly, roller doors and shutters for use with domestic and industrial buildings.

The phenomenon of roller doors and shutters is well known in the art and conventionally such doors and shutters are positioned directly over the door opening at the top of the door frame.

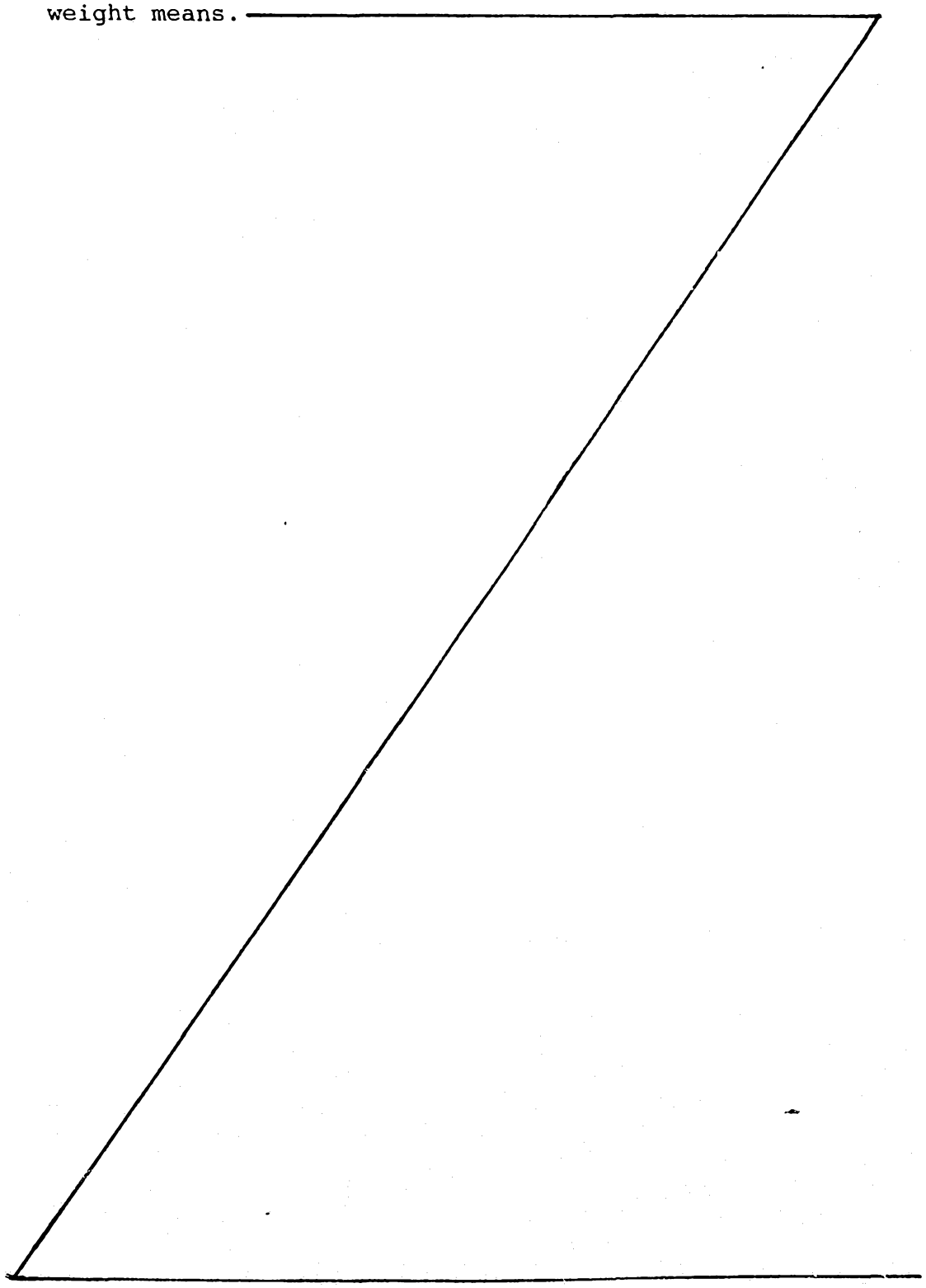
Operation of prior art doors requires an initial upward or downward thrust to retract or unravel the curtain. Prior art doors incorporate handles commonly located in the centre of the curtain and operation of the door requires the operator to bend and lift the curtain, when the curtain is in the closed position or to reach and pull the curtain, when the curtain is in the retracted position. The initial bend or reach combined with the required lift or pull may place undue strain on the lower arms or back of individuals thereby contributing to repetitive strain injury or more serious muscular complaints.

Prior art doors are also prone to misalignment through normal wear and tear and the constant jarring of the door mechanism. It is also known that prior art doors are not appropriate for installation in buildings having inadequate head room.

It is therefore the object of the present invention to overcome the inadequacies of the prior art by repositioning the roller door at one or more sides of a building entrance and providing a ~~novel~~ roller door mechanism in conjunction with the roller door.

In accordance with the invention there is provided a retractable door moveable horizontally including a curtain member able to be wound about a drum member

defined by a vertically disposed axle means, said curtain member being secured to a tension means and said tension means being countered by a plurality of weight means.



The present invention also provides one or more retractable doors having a curtain member located about a drum member defined by an axle means, said curtain member secured to a tension means said tension means anchored to the drum member.

The present invention provides one or more retractable, side doors having a curtain member rolled about an axle means thereby defining a drum member, said axle means and curtain member secured to and tensioned by spring means said tension between the spring means and curtain member countered by a plurality of weight means ~~secured to the leading edge of said curtain member.~~

In a preferred embodiment the tension means comprises an elasticised cord. The drum means may also house a radio control unit to facilitate opening and closing of the side doors.

The present invention will now be described by way of Example in which:-

Fig. 1. is a perspective view of the roller door of the present invention,

Fig. 2. is a sectional end view of a guide rail in accordance with the present invention, taken along the Line II - II,

Fig. 3. is a sectional end view of a guide rail in accordance with the present invention, taken along the Line III - III,

Fig. 4. is a sectional plan view of a pulley mechanism in accordance with the present invention,

Fig. 5. is a partial rear view of the pulley mechanism of Fig. 4 in accordance with the present invention,

Fig. 6. is full sectional rear view of the door mechanism of the present invention,

Fig. 7. is a sectional perspective view of the weighted mechanism in accordance with the present invention,

Fig. 8. is a sectional end view of the weighted mechanism in accordance with the present invention.

The curtain 10 is corrugated and adapted to coact with guides 11 and 12 the guides 11 and 12 having a thickness determined by the depth of the corrugations.

Each guide 11 and 12 is preferably constructed from substantially U-shaped members suitable to allow the curtain 10 sufficient clearance for unhindered sliding but without allowing unnecessary slack between the curtain 10 and the guides 11 and 12.

As seen in Fig 1 the respective curtains 10 may be retracted from the doorway opening and rolled about the drum 13 to a retracted position as shown in Fig 6. As will become evident, the action of rolling the curtain 10 to the retracted position may be done with relative ease due to the roller mechanism which will be described in more detail in the following discussion.

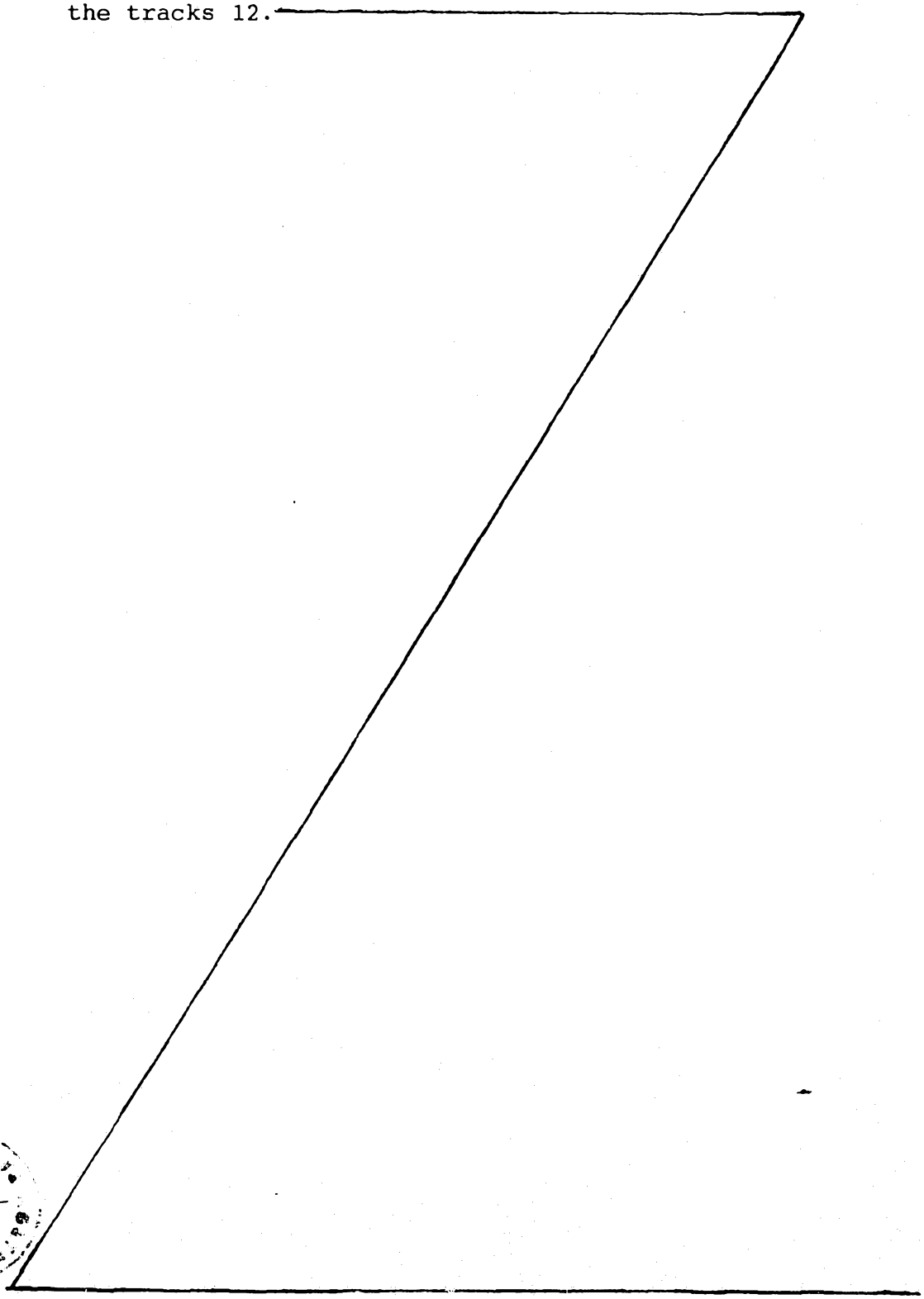
Referring to Figs 4 and 5 it will be seen that a cable 14 is anchored to the top edge of the curtain 10 by an anchorage 15. The anchorage 15 does not assist curtain movement but merely prevents slackening of the curtain 10. The cable 14 may be anchored by a known saddle clip or any other suitable means of fixing the cable 14. The cable 14 is threaded around and passed over a small pulley 16 and threaded around and passed over a second small pulley 17 and wrapped around a large pulley 18 located on the drum 13. The cable 14 is anchored to the large pulley 18 by any suitable means.

In the retracted position, the roller curtain 10 is rolled about the drum 13, the drum 13 rotating about an axle 19, said axle 19 secured at its lower end within a concrete slab 20. The axle 19 carries a spoked drum wheel 21, 21' at either end to support drum 13 as shown in exploded schematic in the Figures.

The track 12 is secured to the ground by bolts 23 evenly spaced along the length of the track 12. As can be seen in Fig. 3 the bolts 23 are driven through flanges 24 and into ground or a cement slab 25. The track 12 is substantially U-shaped in cross-section having side walls 26 connected by a web 27 and angled lips 28 ending in flanges 24.

The track 12 is shaped to receive the bottom edge of the curtain 10 and is laid in two pieces each piece extending from the respective inside walls 30 of the door frame 31 to a central position 32. The two pieces do not meet but end just short of each other to allow for easy cleaning of the track 12. In the

closed position the bottom corner edges 33 of the respective curtains 10 slightly overhang the end of the tracks 12.



To draw the curtains 10 together and lock, an operator (not shown) need only pull the respective curtains to the central position 32 and lock the doors together. The lock 34 comprises twoknown external handles 35 having incorporated therein a known stricker and catch lock wherein the stricker 36 is pivoted into the catch 37 and the curtains 10 secured in the closed position.

In Fig. 6, the curtain 10 is rolled about an axle 19 which axle 19 is mounted at one free end by bracket 38. The axle 19 has a coil spring 39 which acts to tension the curtain 10 on the axle 19. The tensioning of the coil spring 39 is counteracted by a series of weights 40. The weights 40 are mounted, by known means, on a belt 41. The belt 41 and weights 40 are located within and guided by track 11. The track 11 is in cross-section a square U-shape having inwardly opposed lips 42, side walls 43 and connecting web 44.

The weights 40 are supported within the track 11 by one or more supports 45 guided along by lips 42 of the track 11.

The weights 40 are substantially rectangular in cross action and are not interconnected in order to allow proper balance of the weights 40. The belt 41 and weights 40 are supported at edge 23 by skid weight 46 which is preferably nylon. When the curtain 10 is advanced to the door closed position the combined mass of the belt 41 and weights 40 is equal to the tension of the coil spring 39.

In the closed state, the two curtains 10 are drawn together and fully extended. To ensure security locking, the leading edge of one curtain is provided with a storm seal 47 (not shown). The storm seal 47 prevents access to the stricker/catch lock.

The momentum required to push the curtains 10, into the closed state, and subsequently pull the curtains 10 apart is provided by the above-mentioned pulley system. The system comprises a large pulley 18, located towards the top end of the axle 19, having a cable 14 secured to and wrapped around the pulley 18.

When the doors are opened the curtain 10 is wound back onto the drum 13 by horizontally pushing the curtain towards the corresponding drum 13. The curtain 10 is guided to the drum 13 by the guides 11 and 12, the energy required to recoil the curtain 10 about axle 19 onto the drum 13 is transmitted to the drum 13 through the cable 14 attached to wheel 18 causing drum 13 to revolve about its axis on axle 19 thereby providing sufficient momentum to rewind the curtain 10.

While the invention has been described in relation to conventional roller doors, it will be appreciated that the invention is applicable to any form of retractable door.

The material used for the curtain 10, tracks 11 & 12, weights 40, spring 39 and axle 19 will be chosen on the basis of availability but will generally be of light-weight, sturdy metal. The belt 41 will generally be made of fabric and the cable 14 of elasticized shock cord. However, in all cases the devices used will be made of materials as availability and price may dictate.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A retractable door including a curtain member moveable horizontally across an opening, attached at one end to and able to be wound about a drum member, the drum member having an axle vertically disposed in use parallel at least one substantially vertical side of said opening, said drum member being secured to a tensioning means to tension said curtain member and tending to wind said curtain member about said drum member, said tensioning means being counterbalanced by weight means attached to said curtain member.

2. A retractable door as claimed in claim 1 wherein said tensioning means includes spring means.

3. A retractable door as claimed in any one of claims 1, 2 wherein said weight means includes a plurality of weights mounted on a belt.

4. A retractable door as claimed in any one of claims 1-3 further including upper and lower tracks to guide the upper and lower edges of said curtain member during horizontal movement thereof.

5. A retractable door as claimed in claim 4 when appended to claim 3 wherein said upper track has a square U-shaped cross section formed from inwardly opposed lips extending horizontally from vertical side walls spaced by a horizontal web; said belt being located within and guided by said upper track by supports attached to each of said weights, said weights being spaced along said belt with said supports guided upon said lips.

6. A retractable door as claimed in any one of the

preceeding claims wherein said curtain member is connected to said drum member by an elasticised cable said cable being fixed towards the free end of said curtain member and wound about pulleys located in turn adjacent the end point of travel of said curtain member and proximal said drum member.

7. A retractable door as claimed in any one of the preceeding claims wherein said curtain member is corrugated.

8. A retractable door comprising the combination of a plurality of any of the retractable doors as claimed in any one of Claims 1 to 7.

9. A retractable door as claimed in any one of Claims 1 to 7 substantially as hereinbefore described with reference to the Drawings.

Dated this 30th day of January 1991

ANTHONY ROBERT CAMPBELL AND WILLIAM ALAN CAMPBELL
By their Patent Attorneys
HALFORD & CO.

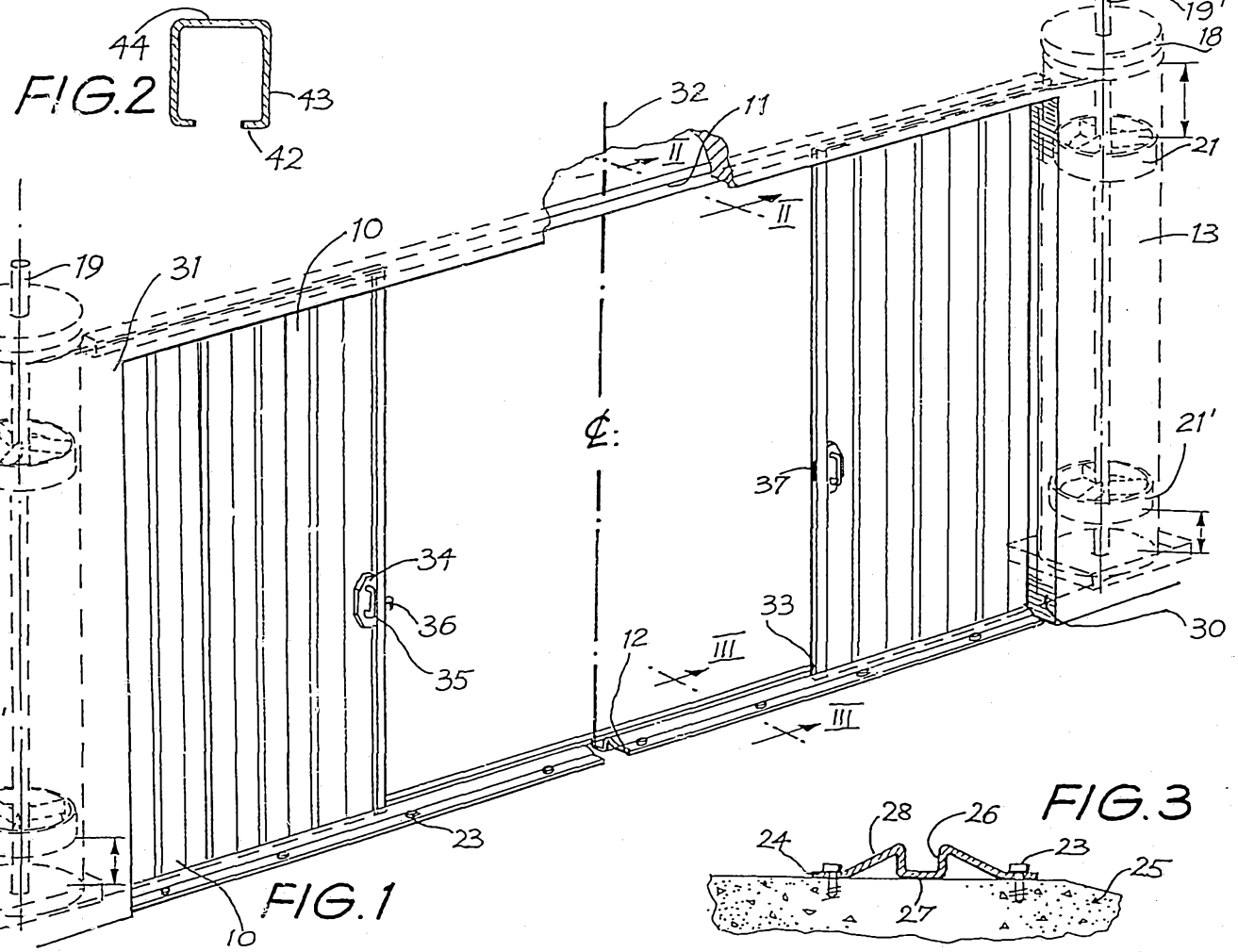


FIG.1

FIG.2

FIG.3

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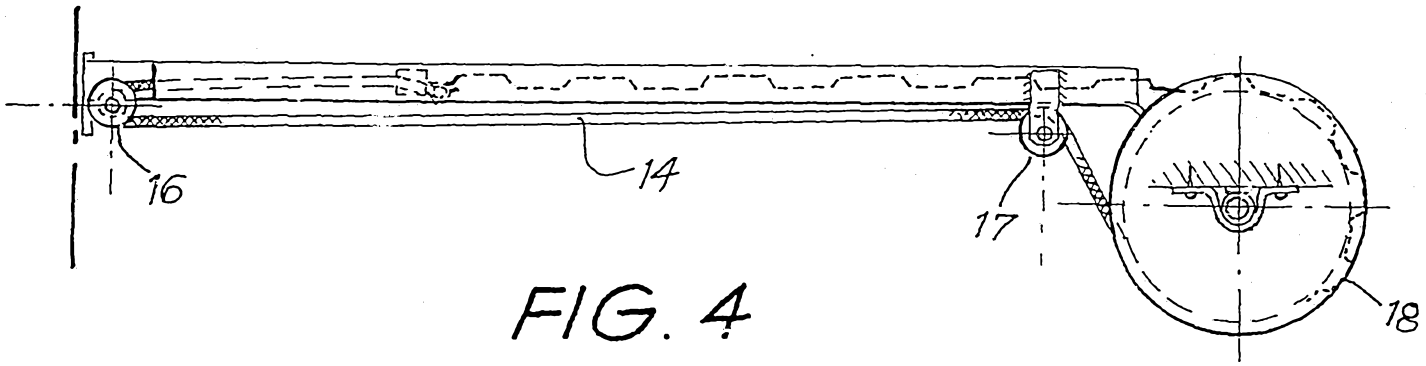

FIG. 4

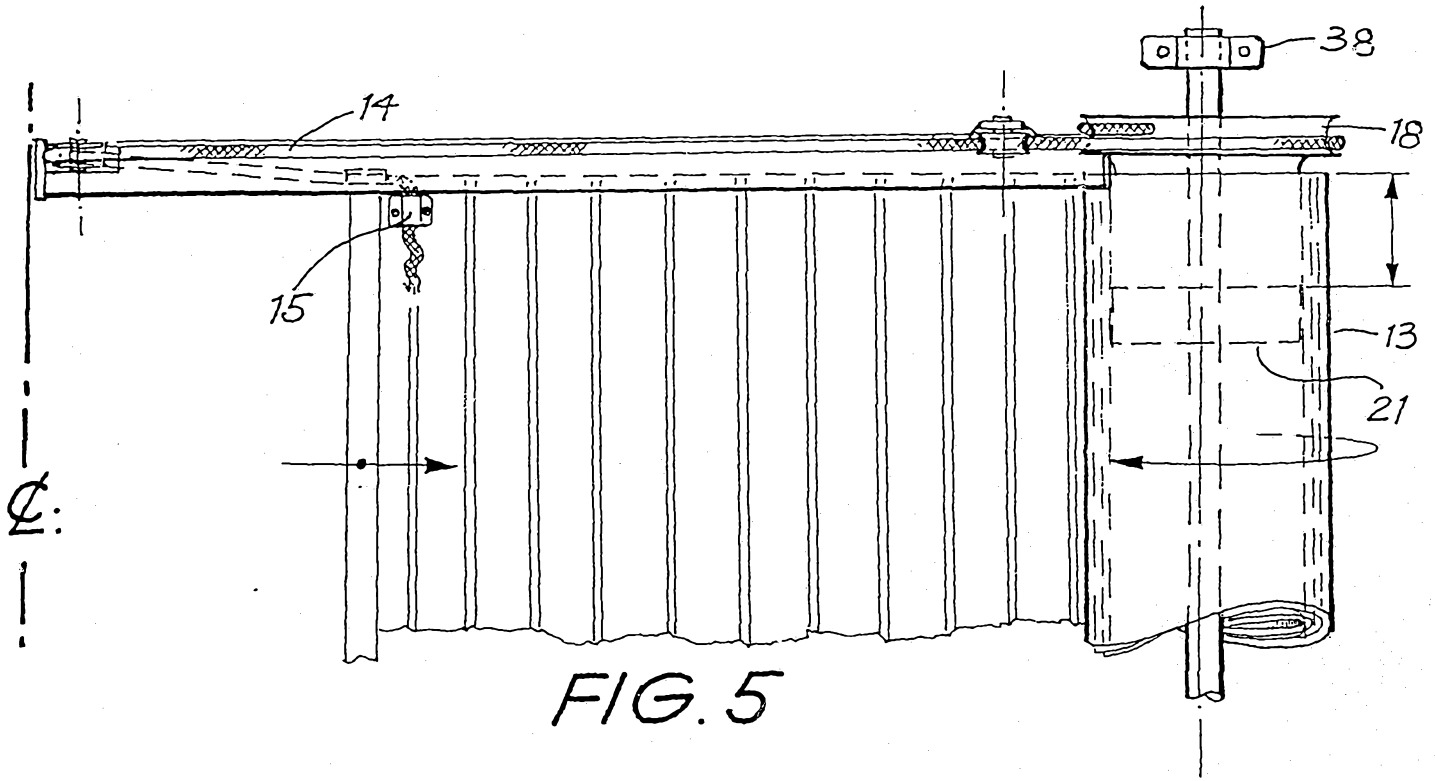

FIG. 5

FIG. 6

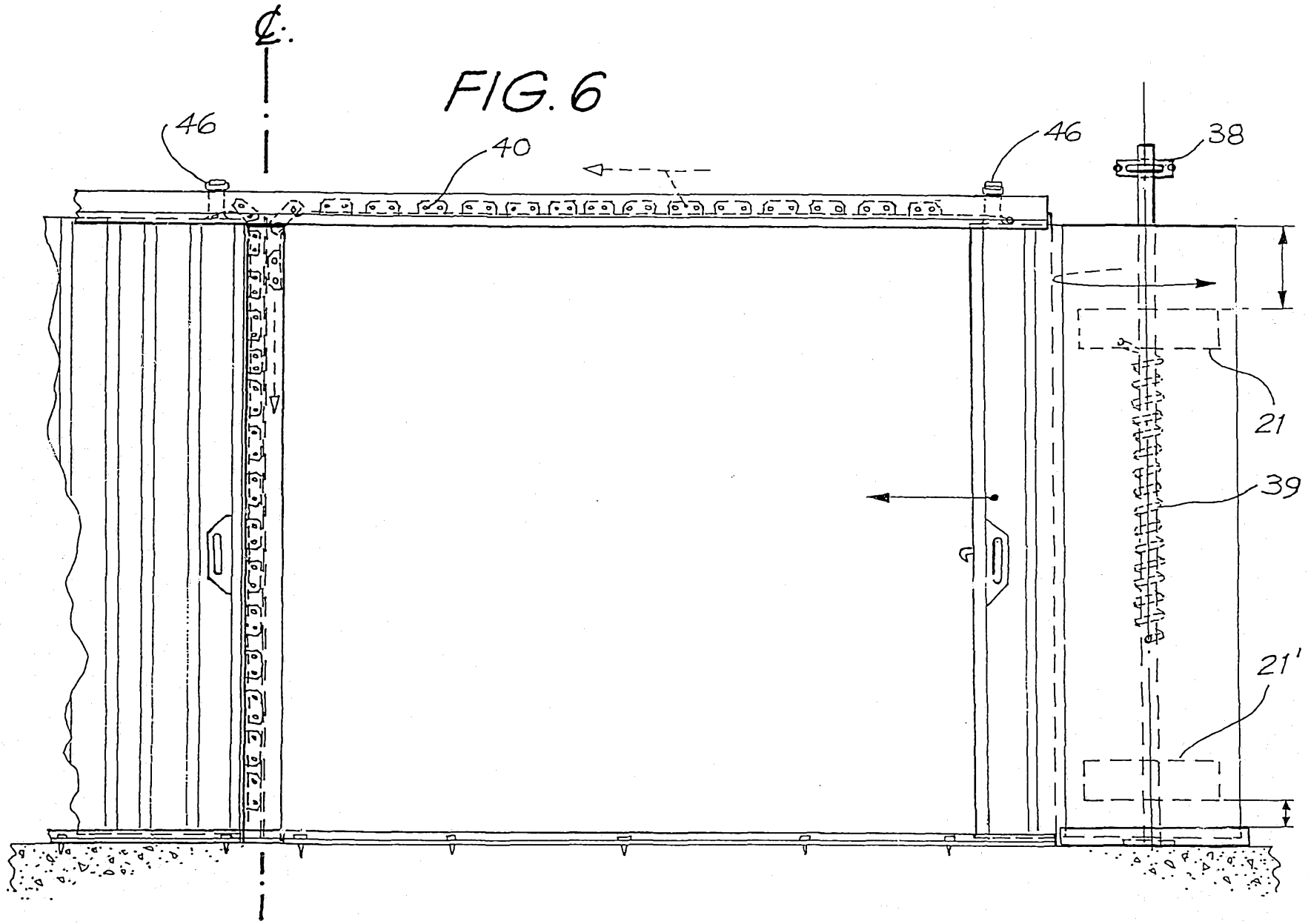

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FIG. 7

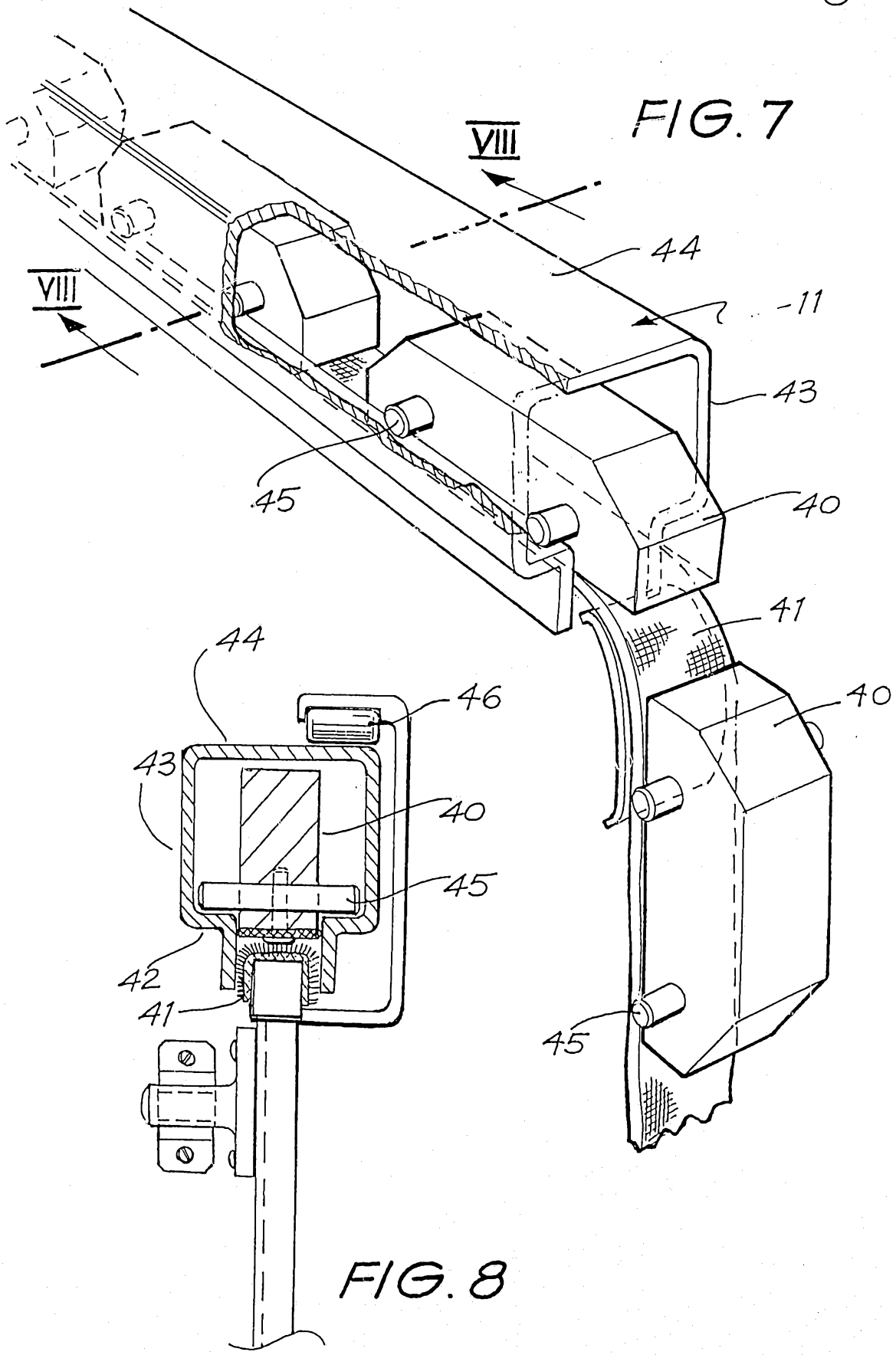

FIG. 8