

[54] DOOR GUIDE

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[51] Int. Cl. .... A47p 88/00

[58] Field of Search ..... 49/197, 386, 465; 312/323, 312/322, 331, 110; 160/206

[56] References Cited

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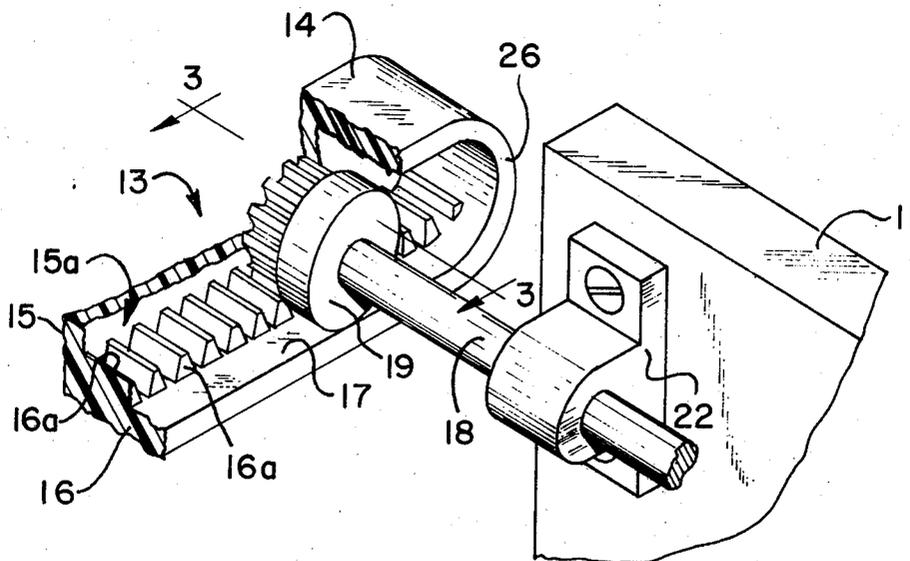
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[57] ABSTRACT

A simplified and dependable construction for the support and guidance of retracting doors and other closures of the type that are particularly useful in business type file cabinets. A preferred construction employs a shaft attached to the door and is provided with gears at its opposite ends which serve as the hinge of the door. The gears are confined within a pair of door guides that contain linearly arranged gear teeth or a gear rack or projections within a guide track which is open on one side. The gear rack teeth mesh with the gears on the door and confine the path of travel of the door along the path of the guides. The outer walls of the guide track prevent derailing of the shaft and confine the movement of the door to rectilinear translation along the trackways without undesired twisting movement. The multiple gear-rack arrangement ensures a timed uniform rectilinear movement of the door. The front and rear ends of the guides are closed to prevent removal of the door and to provide door stop locations.

1 Claim, 4 Drawing Figures



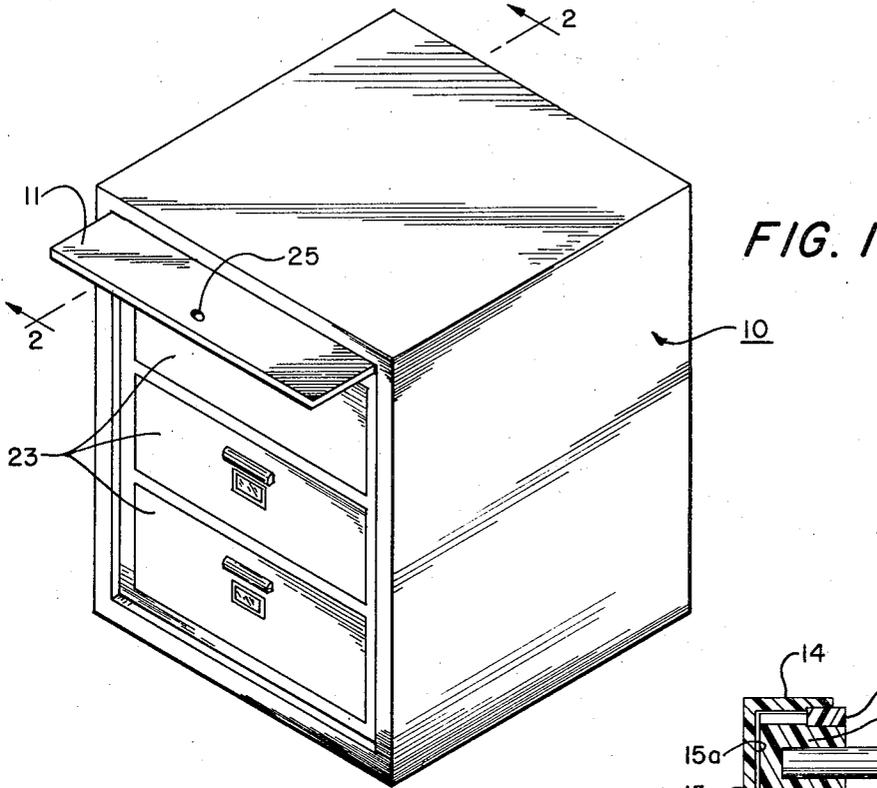


FIG. 1

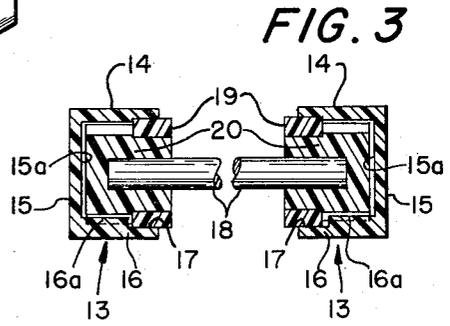


FIG. 3

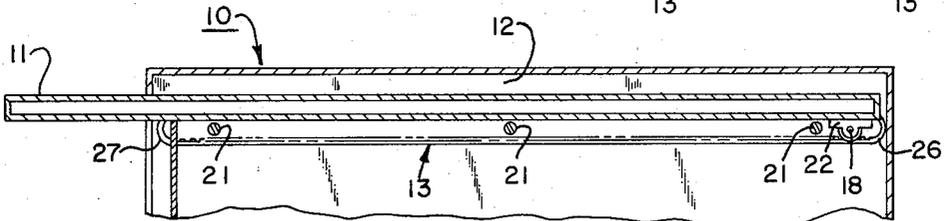


FIG. 2

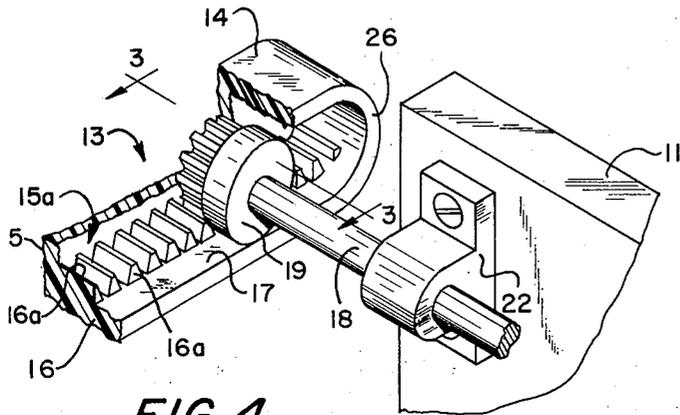


FIG. 4

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## DOOR GUIDE

## BACKGROUND AND STATEMENT OF THE INVENTION

This invention relates to improvements in the guiding and support of doors and moveable panels and is particularly useful for application in office cabinets of the hidden door type wherein the doors are concealable inside of the cabinet when opened and removable from this concealed location to overlie and close the entire front of the cabinet when closed.

There are many patents in the prior art showing the use of concealable "pull out" doors for cabinetry where the door is stored within a slotted opening extending from front-to-back and is removable from its concealed slot on slides or trackways to a position overlying and closing the front of the cabinet.

The early patent of Duffy U.S. Pat. No. 1,077,686 shows one such construction wherein the pull-out door has a pair of geared tracks attached on its underside that mesh with rotatable gear wheels rotatably supported inside of the cabinet.

The Mooney U.S. Pat. No. 1,045,729 shows a safe using a similar construction but wherein the rotatable gear wheels are carried by the door and the gear tracks are supported inside of the cabinet.

Briefly, according to the present invention there is provided a considerably more simplified and inexpensive pull-out door support construction that operates in a similar manner yet is vastly improved over these devices of the prior art. In a preferred embodiment, the entire construction includes only a pair of trackway guides that may be made of molded plastic and are supported inside the cabinet; and a single rotatable shaft having a pair of gears which may be plastic spur gears supported on the slidable and pivotable door. The gears are confined inside of the spaced pair of guideways in such manner that they are permitted but one degree of translational freedom, forward and backwardly, and the door can neither be completely removed, in a forward or backward direction, nor can it be raised or translated sidewise or slantwise from its desired prescribed path.

Since the combined guide and trackway are integrally constructed units, the assembly of the door within the cabinet is also readily performed by merely fastening the integral guideways inside the cabinet at the proper positions while aligning the door shaft and gears therein.

To insure a substantially unimpeded movement between the gears and geared trackway, the preferred construction additionally employs smooth surfaced wheels riding on a smooth ungeared portion of the trackway to support the weight of the door from the meshing gears. In this manner, the gears provide non-slipping guidance of the door along a substantially true rectilinear pathway, to prevent slantwise jamming of the door, yet provide minimized resistance to such rectilinear movement along the prescribed path.

## BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view illustrating a conventional office file cabinet incorporating the pull-out door construction of the present invention,

FIG. 2 is a partial sectional view taken along lines 2-2 of FIG. 1,

FIG. 3 shows an enlarged sectional view taken along line 3-3 of FIG. 4, and

FIG. 4 is an enlarged perspective view showing the construction of the trackway and meshing of a door gear therewith.

## DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

As shown in FIGS. 1 and 2, the office file cabinet 10 may be of conventional construction having a series of pullout drawers 23, or shelves (not shown), that are accessible from the front of the cabinet. A concealable pullout door or closure 11 is provided that is stored within an upper or lower or side located slotted opening 12 provided about the cabinet opening and formed from front-to-back in the cabinet 10. The door 11 is slidable outwardly from the slot 12, on a pair of geared trackways 13, and is then pivotable downwardly, upwardly or sideways over the opening in the cabinet 10 to overlie and close the cabinet opening. If desired a lock 25 may be provided on the door 11 which is suitably interengageable with a latch or recess on the cabinet (not shown).

For supporting and guiding the door or panel 11, a pair or trackways 13 are provided inside of the cabinet and disposed in confronting relationship at the opposite sides of cabinet 10 within the slot 12, as best shown in FIG. 2.

According to a preferred embodiment, the trackways 13 are integrally molded, elongated, members of suitable plastic material. Alternatively metal or other material could be employed. As best shown in FIGS. 3 and 4, each such trackway 13 is comprised of a base 16, side wall 15, and upper wall 14 which in cross-section appears as a "C-shape" with an open side or cavity 15a facing the inside of the cabinet. Obviously other cross sectional shapes could be employed and the base 16 could be angled. The base 16 is integrally formed with a series of gear teeth or rack 16a projecting upward from the inside of the base within the cavity 15a. The gear teeth 16a have a width that is narrower than the width of the trackway so that a smooth portion or smooth track 17 is provided on the base wall alongside of the gear teeth 16a and arranged inwardly towards the center of cabinet, as best shown in FIG. 4.

For interengaging with the trackways 13, the underside of the door or panel 11 is provided with a transversely disposed elongated shaft 18, located near its rear edge or end portion as shown in FIGS. 2 and 4. Shaft 18 is rotatably supported on the door 11 by a pair of bearings 22, (only one being shown) that are positioned near the sides of the door and suitably fastened to the door 11 by screws or other appropriate fasteners, as shown. The bearings could also be formed within the door or by the door itself in the case of molded or cast doors.

At each opposite end of shaft 18 there is provided a combined spur gear 20 and wheel 19. The gear 20 and wheel 19 may be integrally molded of plastic in a concentric side-by-side relationship as shown, and the combined unit is preferably press fitted, molded or pinned onto the rotatable shaft 18 that is preferably made of suitable metal, plastic, wood or other material. In the case of an angled rack 16a miter or bevel gears could be used.

As variously shown in FIGS. 2, 3, and 4, the spur gear 20 is in mesh with the rack 16a on the trackway 13, and

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the wheel 19 positioned alongside of the gear 20 and having a greater diameter than the gear 20, rides on the smooth track portion 17 inside of the trackway member 13.

The purpose of providing the smooth surface wheel 19 is to remove the weight of the door from the meshing gears and accordingly minimize friction in the meshing gears so that the pull-out door 11 can be easily opened or closed. The meshing gearing on the other hand serves as a timing means to require uniform movement and insures that the door 11 is openable and closable without twisting or jamming, since neither side can slip or travel a different distance than the other side of the door.

It will be observed from FIG. 4, that each combined spur gear 20 and wheel 19 is completely confined within its associated cavity 15a of the trackway 13, since each end of the trackway 13 is also closed by end portions 26, 27 as shown. These end portions are semi-cylindrical in configuration to provide a stop at each end to prevent the door 11 from being removed, or from exiting, from the trackways. As will be recalled, a pair of such trackways 13 are provided on opposite ends of the shaft 18 so that once installed, the members can not be derailed or disengaged without removing one of the trackways. Accordingly, by this construction, the door or panel 11 is securely retained and slidably mounted within the cabinet in such manner that it cannot be derailed or jammed within the slotted opening 12 of the cabinet.

For assembling the door 11 within the cabinet, one of the trackways 13 is first fastened, as by a series of screws 21, to the inside wall of the cabinet at one end of the slotted opening 12. The door is inserted with its end gear 20 and wheel 19 positioned therein and with the other trackway 13 assembled onto the opposite gear and wheel 19 at the other end of the shaft 18. This opposing trackway 13 is then suitably fastened to the opposite inside wall of the cabinet at the other side of the slot 12 and in proper alignment with the first trackway 13.

In the preferred construction there are provided only three parts or subassemblies; the two trackways 13, and the shaft 18 with its associated gears 20 attached thereto, and supported on the panel or door 11 by a pair of bearing supports 22. This simplified and inexpensive construction can be easily assembled by semi-skilled or unskilled workers.

Although this preferred mechanism has been illustrated in combination with a three drawer file cabinet having an overhead concealable door, it is considered evident to those skilled in the art that it may be em-

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ployed in many other types of furniture and building constructions. Accordingly this invention should be considered as being limited only by the following claims:

What we claim is:

1. An improved enclosure body-closure combination comprising, in combination:

means forming a polygonal cabinet having a forward opening and top wall and side walls and a movable closure concealable inside said cabinet along said top wall and movable to a cabinet-closed position obturating said forward opening and to a cabinet-open position concealed within said cabinet along said top wall thereof and support and guidance means for the door forming a suspension mount therefor,

said support and guidance means comprising a pair of elongated door guides affixed within the cabinet on opposite side walls thereof adjacent said top wall and extending from front to back thereon,

each of said elongated door guides comprising an elongated channel having base, side and top walls and being open at one side with the guides being disposed with their channels in confronting relationship to each other,

means forming geared and smooth tracks disposed along the base wall of each of the door guides and extending substantially the entire length thereof terminating in semicylindrical ends,

the smooth track being disposed adjacent the open side of the channel and the gear track being disposed adjacent the closed side of the channel,

shaft means forming a shaft with ends disposed in each of said confronting channels,

combined gear and smooth roller means arranged on said shaft ends and disposed in said channels with said geared portions being disposed outside said smooth portions and making with corresponding sections of said guide tracks,

the guide track smooth and geared portions being integrally formed as a pair of single units and the gear and smooth roller means being integrally formed as single units with the smooth roller of each pair having a greater diameter than the gear roller thereof, and

plural bearing means engaging said shaft at spaced locations thereon between said roller means and being mounted on said closure at a back end thereof to serve as sole support thereof when the front end thereof is hand held.

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