Aug. 9, 1966 E. G. SMITH 3,265,118

OVERHEAD DOOR RETAINING MEANS

Filed May 11, 1964

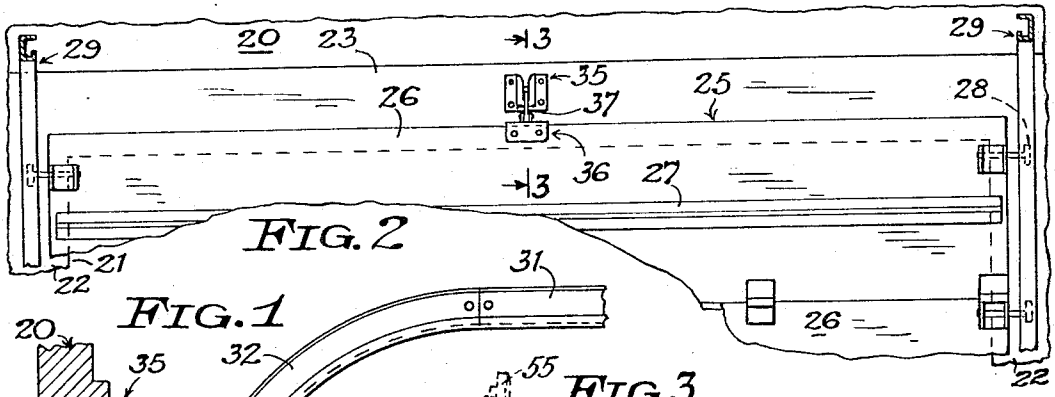


FIG. 2

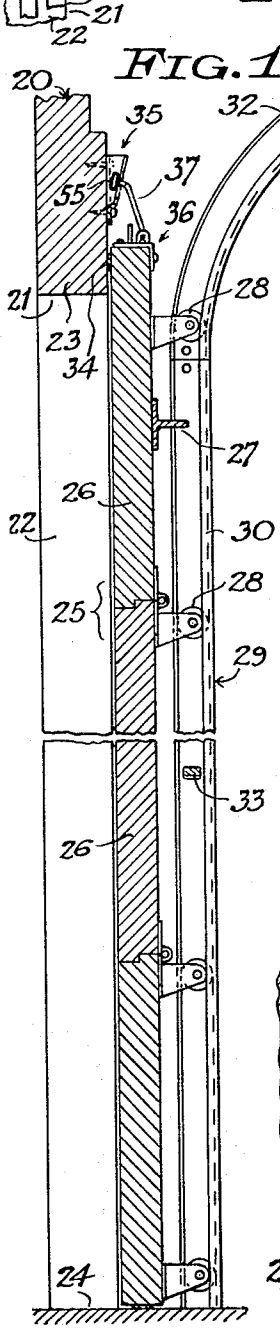


FIG. 1

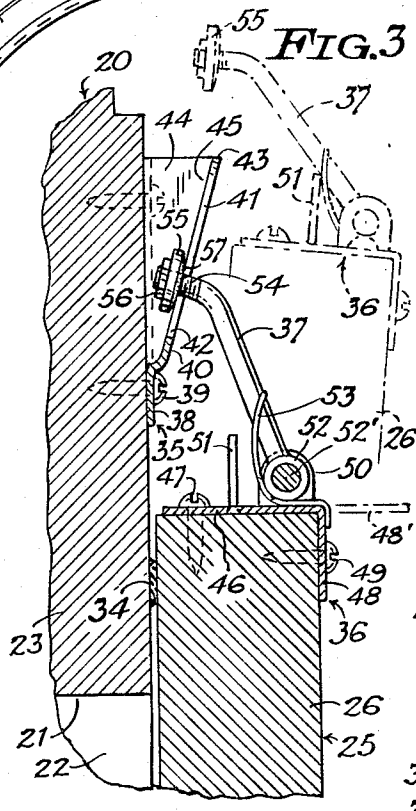


FIG. 3

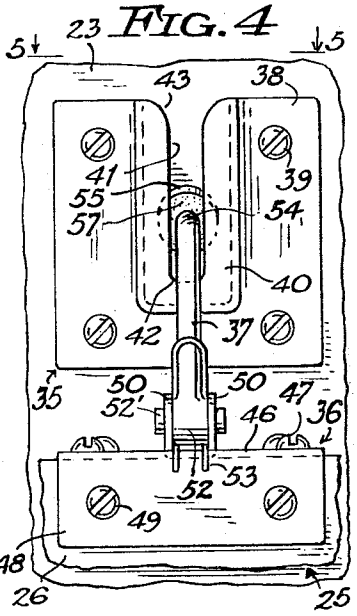


FIG. 4

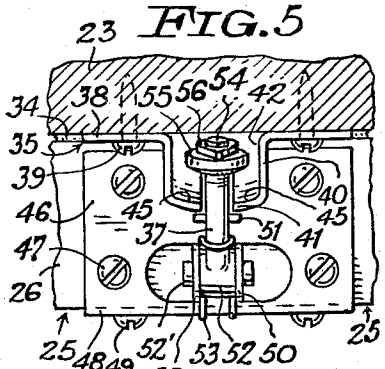


FIG. 5

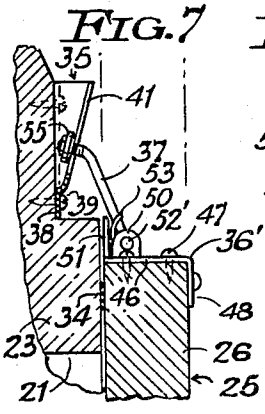


FIG. 7

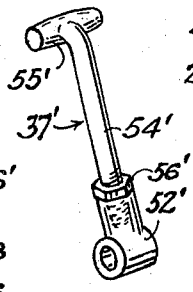


FIG. 6

INVENTOR.
ERNEST G. SMITH
BY Christopher L. Weal
ATTORNEY

United States Patent Office 3,265,118 Patented August 9, 1966

3,265,118

OVERHEAD DOOR RETAINING MEANS

Ernest G. Smith, 4215 N. 93rd St., Milwaukee, Wis.

Filed May 11, 1964, Ser. No. 366,557
7 Claims. (Cl. 160—209)

This invention relates to overhead doors and more particularly to retaining means for holding a door of this type against a doorway header or lintel.

A conventional overhead door for closing a building doorway comprises a series of hingedly connected panels the opposite ends of which are provided with rollers movable along guide tracks including generally vertical sections adjacent to the opposite sides of the doorway and elevated horizontal sections for supporting the door in its open position. In the closed position of the slidable door the opposite side edges of the door are disposed close to or in contact with the doorway jambs, the lower edge of the door is close to or in contact with the floor, and the upper edge of the door extends closely along the inner side of the doorway header or lintel. The bottom edge and the opposite side edges of the closed door can readily be fitted close to the corresponding edges of the doorway, and in some instances weather stripping is provided along the meeting edges. However, difficulty has been experienced in providing a snug or close fit between the doorway header or lintel and the upper edge of the closed door, since wind pressure on the door will deflect or bow the door inwardly and thus produce a gap between the header and the upper edge of the door, resulting in considerable heat loss as well as permitting undesired exposure to the weather. In the case of a wide overhead door, this gap formed along the doorway header by wind pressure may be of considerable extent, even though horizontally extending anti-sag bracing is provided on the inner side of the door.

An object of the invention is to provide a simple, reliable and inexpensive holding or retaining means for automatically insuring a close fit between the header or lintel of a building doorway and the upper edge of an overhead door when the door is in closed position, the retaining means resisting external wind pressure tending to bow the door inwardly, and being of such character as to avoid interference with the opening and closing of the door.

Another object is to provide retainer fittings for this purpose which can be easily and expeditiously applied to existing overhead door installations.

A further object is to provide door holding or retaining means which can readily be adjusted to compensate for wear or inaccuracies of assembly.

The invention further consists in the several features hereinafter described and claimed.

In the accompanying drawings, illustrating certain embodiments of the invention,

FIG. 1 is a fragmentary central transverse vertical sectional view of an overhead door installation embodying a preferred form of door-retaining means of the invention, the door being shown in closed position;

FIG. 2 is a fragmentary inside elevational view of the upper portion of the door installation, the door being shown in closed position;

FIG. 3 is a detail vertical sectional view on an enlarged scale taken generally on the line 3—3 of FIG. 2, a nearly closed passing position of the door being shown in broken lines;

FIG. 4 is a fragmentary detail inside elevational view of the mounted door retainer assembly with the door in closed position;

FIG. 5 is a detail sectional view taken generally on the line 5—5 of FIG. 4;

FIG. 6 is a perspective view of a modified form of headed arm or lever of the door-retaining means;

FIG. 7 is a fragmentary sectional view generally similar to FIG. 3, but at a reduced scale, showing a modified door installation in which the door is movable upwardly to a vertical open position.

Referring to FIGS. 1 to 5 of the drawing, **20** designates a building, such as a garage, warehouse, or factory, having a doorway **21** defined by opposite jambs **22**, a horizontal header or lintel **23**, and a floor **24**, the jambs and header forming a door frame. An overhead door **25** of conventional type per se is shiftable to open and close the doorway and comprises the usual series of hingedly connected door panels or sections **26**. The top panel of the door is here shown to be provided at its inner side with a conventional horizontal reinforcing or bracing bar **27** to resist sagging. Similar bracing bars, not shown, may be applied to the other door panels. The door panels or sections **26** are commonly made of wood. However, other types of door panels, such as of fiber glass, or of hollow sheet metal, are sometimes provided.

The door panels or sections carry at their opposite side edge portions the usual rollers **28** riding in spaced guide tracks **29** which comprise generally vertical track sections **30** adjacent to the door jambs **22**, elevated horizontal track sections **31**, and curved track sections **32** connecting the vertical and horizontal sections. The usual locking bar means **33**, engageable with the vertical track sections, is provided for locking the door in closed position. The door may be either manually-operated or motor-operated and is provided with the usual counter-balancing means, not shown.

In its closed position the door covers the doorway, the opposite side edges of the door being close to or in contact with the inner faces of the door frame jambs, the bottom edge of the door resting on the floor, and the upper edge portion of the top panel of the door being adjacent to the inner vertical face of the door frame header or lintel **23**. Conventional weather stripping may be provided along the edges of the doorway and is here shown to include a resilient strip **34** secured along the inner face of the header to be engaged by the outer face of the top door panel. In its open position the door is supported in horizontal position by the elevated horizontal track sections **31**.

When the door is in its closed position, the upper edge of the top door panel is normally close to the inner face of the door frame header **23**. However, in the case of a conventional door installation, strong wind pressure on the door will deflect or bow the door inwardly, producing a gap of considerable size between the top door panel and the header. This gap is quite pronounced in the case of a wide door, even when the door panels are provided with bracing at their inner sides. The presence of the gap is undesirable, as a substantial heat loss will result, and the interior of the building will be exposed to the weather.

In order to insure a close fit of the door with respect to the door frame header, notwithstanding strong wind pressure tending to unseat or bow the door inwardly away from the header, the door installation is provided with retaining means of the invention. The retaining means comprises a header fitting **35** and a cooperating door fitting **36** which includes a pivoted door-holding arm **37** hereinafter described. These fittings are shown to be disposed midway of the width of the door adjacent to the upper edge of the door. In the case of an unusually wide door, two or more spaced sets of these fitting assemblies may be provided.

The header fitting **35** comprises a plate **38** of heavy sheet metal rigidly secured by screws **39** to the inner vertical face of the header and having a channel-shaped embossment **40** converging downwardly and inwardly to-

ward the lower portion of the plate. A slot 41 extending in an up-and-down direction bisects the embossment and has a closed lower end 42 and flaring open upper end 43, FIG. 4. The embossment 40 forms an upwardly opening V-shaped pocket 44 with the vertical inner face of the header, and the steeply sloping inner face of the embossment presents cam surfaces 45 at opposite sides of the slot.

The door fitting 36 comprises a plate 46 of heavy sheet metal bearing on the upper edge face of the top door panel and rigidly secured thereto by screws 47. The plate 46 has a downturned flange 48 secured by screws 49 to the inner face of the door panel. The plate originally includes a coplanar extension 48', FIG. 3, which is bendable downwardly at selected bending lines to form the flange 48, thus accommodating door panels of different thickness. A pair of laterally spaced ears 50 are secured to or struck up from the horizontal portion of the plate 46 at its rear portion, and a stop projection 51 is secured to or struck up from the plate forwardly of the ears 50. The arm or lever 37, which is of rod-like shape, has a hubbed end 52 disposed between the ears 50 and pivotally secured thereto by a horizontally extending pin or bolt 52', the arm being swingable in a vertical plane normal to the plane of the door. A spring 53, such as of the hairpin type, urges the pivoted arm in a direction to rest on the stop projection 51. The pivoted arm 37 has a bent free end 54 which is screw-threaded and snugly receives thereon a nut-forming disk-shaped head 55 and a lock nut 56 therefor, the head having a convexly rounded front face 57. The arm is adapted to travel in the upwardly opening slot 41 of the header fitting 35, and the arm head 55 is adapted to slidably engage the sloping inner cam faces 45 of the header fitting at opposite sides of the slot. In some instances, the arm head or the cam faces may be Teflon coated to provide a slippery surface. The screw-threaded arm head 55 can be shifted along the pivoted arm to provide optimum adjustment and to compensate for variations and inaccuracies in manufacture and assembly, as well as to compensate for wear.

When the door 25 is actuated in closing direction from its open horizontal position, the door panels in their travel along the curved track sections 32 clear the projecting header fitting 35, and as the door approaches its vertical closed position the headed free end portion of the pivoted arm 37 of the door fitting 36 enters the upwardly opening slot 41 of the header fitting embossment 40, the arm head 55 being then disposed in the pocket 44 of the embossment. The pivoted arm 37 in its free spring-urged position is at a favorable angle to insure entry of the arm head 55 behind the slotted header fitting embossment 40, it being noted that immediately prior to this entry, the upper edge of the top door panel is spaced inwardly from the header by reason of the arcuate travel of this panel along the curved track sections 32. As the top door panel moves downward and outward toward the door frame, the arm head 55 slidably engages the cam surfaces 45 at the inner side of the slotted embossment with a camming action, thus moving the arm toward a steeper angular position, as best seen in FIG. 3, and thereby forcing the outer face of the upper edge portion of the top door panel outwardly into abutment with the weather strip 34 on the inner face of the door frame header when the door becomes fully closed. The upper edge portion of the top door panel is thus held firmly against the header regardless of wind pressure on the outer face of the door tending to bow the door inwardly, thereby minimizing heat loss and preventing entrance of wind, rain and snow into the building.

The modified form of pivoted arm or lever 37' shown in FIG. 6 comprises a rod 54' with a T-shaped head 55' at its bent free end and a screw-threaded opposite end which is tightly secured into a radially projecting part of a hollow hub member 52', the rod being retained in longitudinally adjusted position on the hub member by a lock nut 56'. The arm 37' is pivotally mounted on the door fitting 36 in the same manner as the arm 37 of FIG. 3, and the T-shaped head 55' is adapted to slidably bear on the cam surfaces 45 of the header bracket 35. The screw-threaded connection between the headed rod 54' and the hub member provides for optimum adjustment and compensates for variations and inaccuracies in manufacture and assembly of the various parts, as well as compensating for wear. The T-shaped head 55' may be Teflon-coated, like the nut-forming head 55 of FIG. 3.

The modified form of overhead door installation shown in FIG. 7 includes a header fitting 35 like that of FIG. 3 and a cooperating door fitting 36' somewhat similar to that of FIG. 3, but the attached header fitting is recessed or inset from the vertical plane of the inner marginal portion of the header 23 to avoid interference with the movement of the door 25 which in its opening and closing travel is guided to move entirely in a vertical plane. In some instances, this door may consist of a single panel. The door fitting 36' is similar to the fitting 36 of FIG. 3 except that the supporting ears 50 and stop projection 51 for the pivoted arm 37 are close to the plane of the outer or weather face of the top door panel. When the door is in closed position, the pivoted arm 37 holds the door firmly against the header, as in the structure of FIG. 3. The structure of FIG. 7 may also be used in the case of an overhead door installation with guide tracks like those of FIG. 1.

I claim:

1. An overhead door construction comprising, in combination with a building door frame providing a doorway and having a header, and a track-guided door for opening and closing the doorway and when in closed position being vertically disposed with the upper marginal portion of the door lapping the inner side of the header, of a first retainer fitting rigidly secured to the inner side of the header at an intermediate point of the width of the doorway and having a portion projecting inwardly from the header and provided with an upwardly opening slot extending downwardly in said projecting portion, said projecting portion having cam surfaces along opposite sides of said slot sloping downwardly and forwardly and facing the header, a second retainer fitting including an arm pivotally secured to the top portion of the door and swingable through a limited angle in a vertical plane normal to the door, said arm projecting upwardly and forwardly from its pivotal axis and adapted to move in said slot when the door is at the lower portion of its travel, and a head on the free end portion of said arm engageable with said cam surfaces with a camming action as the door moves downwardly toward its closed position to thereby urge and hold the upper marginal portion of the closed door against the inner side of the header, said first retainer fitting and said headed arm engaging the same forming a relatively unyielding connection when the door is in closed position to prevent inward deflection of the upper portion of the closed door by external wind pressure.

2. A door construction according to claim 1, in which the first retainer fitting is in the form of a plate having an embossment projecting inwardly of the header and including an inclined web presenting the upwardly opening slot and the cam surfaces.

3. A door construction according to claim 1, in which the distance between the arm head and pivotal axis of the arm is adjustable to vary the camming action.

4. A door construction according to claim 1, in which the arm head is adjustably screwed onto the free end portion of the arm to vary the distance between the head and the pivotal axis of the arm.

5. A door construction according to claim 1, in which the swingable arm is spring-urged in an outward direction with respect to the door and is reversely urged by its camming engagement with the first retainer fitting.

6. A door construction according to claim 1, in which the swingable arm has a T-shaped head portion at its free

end engageable with the cam surfaces of the first retainer fitting.

7. An overhead door construction comprising, in combination with a building door frame providing a doorway and having a header, and a track-guided door for opening and closing the doorway and when in closed position being vertically disposed with the upper marginal portion of the door lapping the inner side of the header, of a retainer plate rigidly secured to the inner side of the header at an intermediate part of the width of the doorway and including an embossment projecting inwardly from the header to provide a web portion sloping downwardly and forwardly, said web portion having formed therein an upwardly opening slot extending downwardly in said web portion, and the header-facing side of said web portion presenting cam surfaces along opposite sides of said slot, and an arm pivotally secured to the top portion of the door and swingable through a limited angle in a vertical plane normal to the door, said arm projecting upwardly and forwardly from its pivotal axis and adapted to move in said slot, and a head on the free end portion of said arm

engageable with said cam surfaces with a camming action as the door moves downwardly toward its closed position to thereby urge and hold the outer face of the top portion of the closed door against the inner side of the header, said interengaging retainer plate and headed arm forming a relatively unyielding connection when the door is in closed position to prevent inward deflection of the upper portion of the closed door by external wind pressure.

References Cited by the Examiner

UNITED STATES PATENTS

1,661,706	3/1928	Schobert et al.	292—272
2,008,000	7/1935	Drunst et al	20—19
2,426,052	8/1947	Rix	160—209 X
3,039,153	6/1962	Dusing	20—19
3,104,699	9/1963	Wolf et al.	160—201 X

HARRISON R. MOSELEY, *Primary Examiner.*

KENNETH DOWNEY, *Examiner.*