Nov. 17, 1964 R. DUNCAN 3,157,418

DOOR FITTINGS

Filed Sept. 9, 1963 4 Sheets-Sheet 1

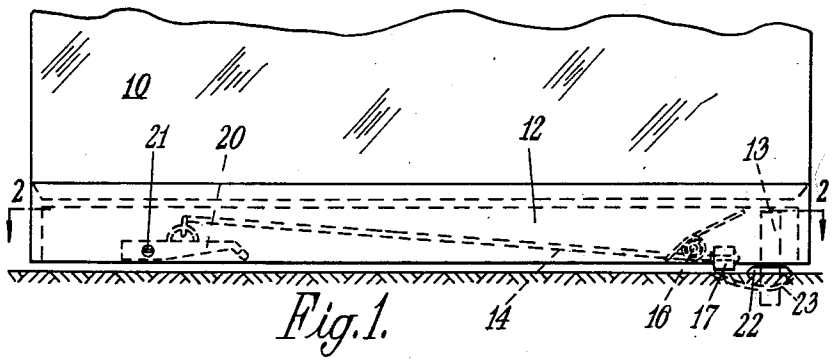


Fig. 1.

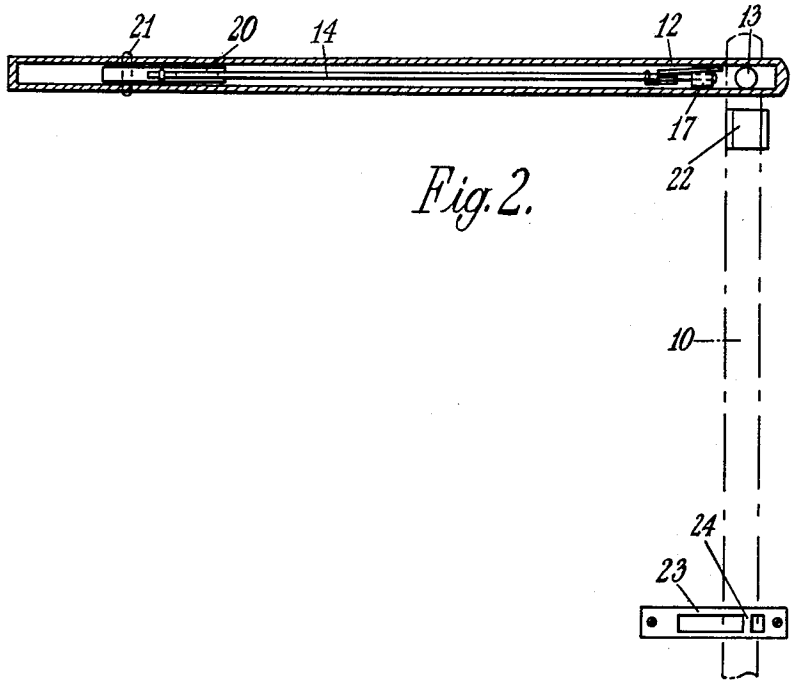


Fig. 2.

Nov. 17, 1964 R. DUNCAN 3,157,418

DOOR FITTINGS

Filed Sept. 9, 1963 4 Sheets-Sheet 2

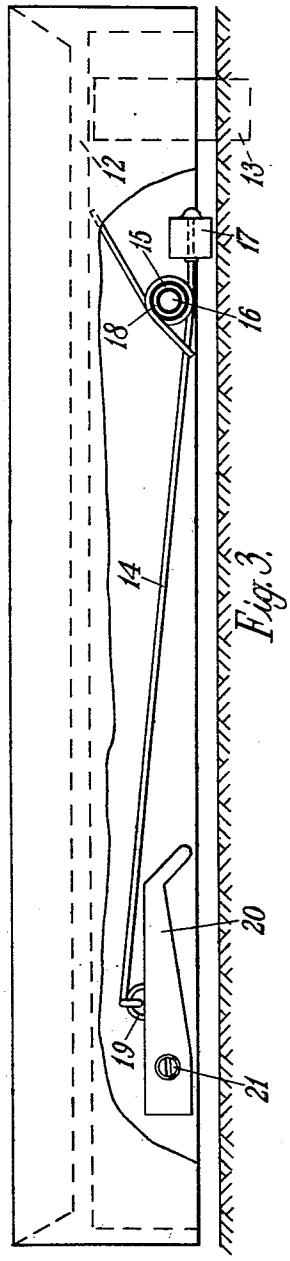


Fig. 3.

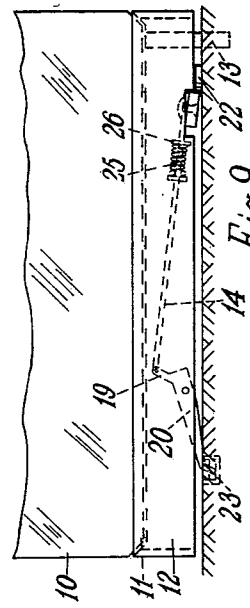


Fig. 9.

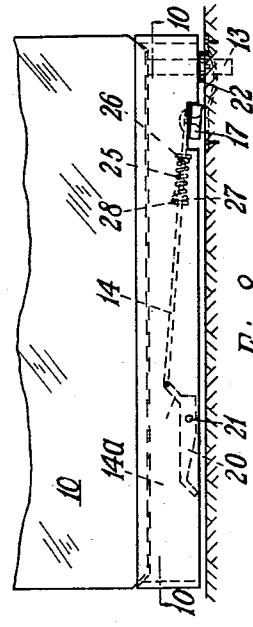


Fig. 8.

Nov. 17, 1964 R. DUNCAN 3,157,418

DOOR FITTINGS

Filed Sept. 9, 1963 4 Sheets-Sheet 3

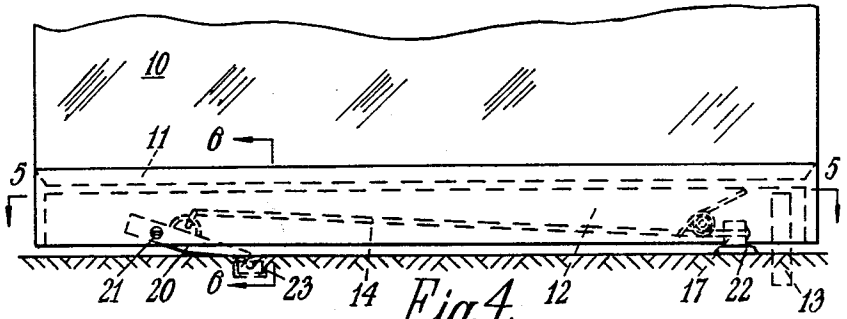


Fig.4.

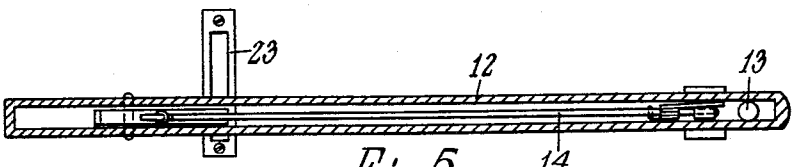


Fig.5.

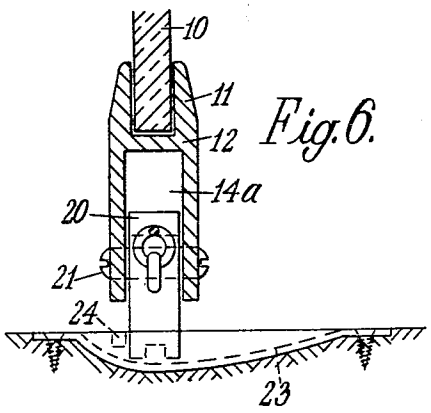


Fig.6.

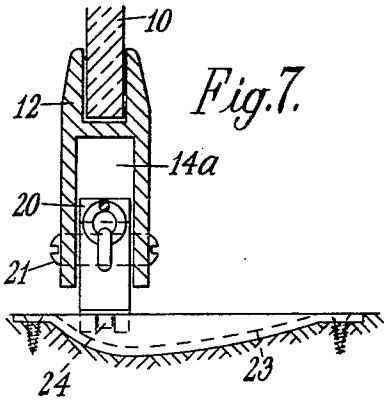


Fig.7.

Nov. 17, 1964 R. DUNCAN 3,157,418

DOOR FITTINGS

Filed Sept. 9, 1963 4 Sheets-Sheet 4

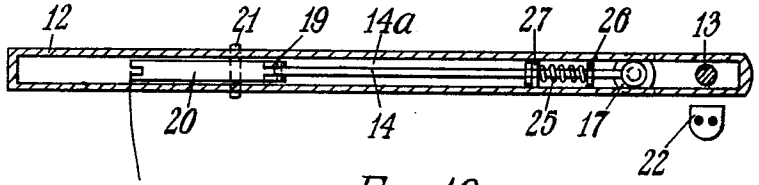


Fig.10.

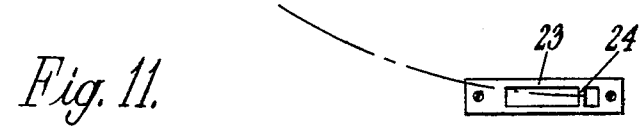


Fig. 11.

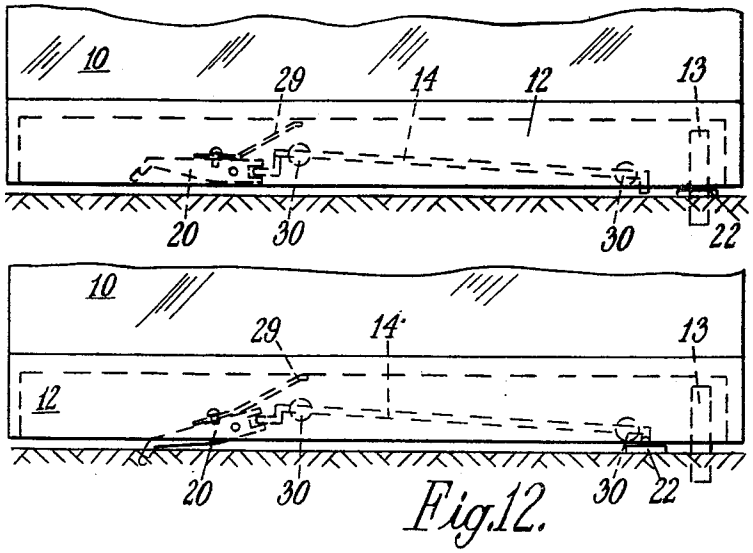


Fig.12.

United States Patent Office 3,157,418 Patented Nov. 17, 1964

3,157,418

DOOR FITTINGS

Robert Duncan, 11/13 W. Campbell St., Glasgow C. 2, Scotland

Filed Sept. 9, 1963, Ser. No. 307,540
6 Claims. (Cl. 292—229)

This invention has reference to door fittings.

A door stop is provided to limit the opening movement of the door and thereby protect the door and door fittings from damage. Usually a door stop is in the form of a rubber or like cylinder which is secured to the floor and which projects upwardly therefrom to contact with the foot of the door when the latter is opened. The most effective position for the stop is such that it contacts with the door near to the opening edge or locking stile of the door. Generally its position is such that it is not less than one third of the width of the door from the hinge side thereof. When the door is opened it abuts against the stop which acts as a fulcrum. The nearer the stop to the hinge side of the door the greater is the danger of damage to the door and its fittings. On the other hand the further the stop is from the hinge side of the door the greater is the danger of people tripping over it.

Where door holders are provided to retain the door in its open position they are in some cases secured to the floor to engage with the foot of the door.

It will be apparent that door holders secured to the floor and projecting upwardly therefrom constitute a danger in that people may trip on such projections.

The present invention has therefore for its object to provide an improved door stop, or door holder, or a combined door stop and door holder which will not constitute a danger to people passing through the doorway.

According to the present invention a door is provided with fittings comprising a keeper or stop sunk into the floor at a position remote from the hinge side of the door, a finger or other member carried by the foot of the door and which is lowered to co-operate with the keeper or stop when the door is opened and a fixture in the form of a cam or ramp located at the hinge side of the door, the cam or ramp controlling the movement of the finger or other member.

The invention further consists in a door having fittings comprising a keeper sunk into the floor, a finger pivoted to the foot of the door at or near the lock side thereof, a rod, blade or the like operatively connected to said finger and extending along the foot of the door to near the hinge side thereof and a cam or ramp positioned near the hinge side and which, when the door is being opened, actuates the link or blade to cause the finger to engage the keeper.

The link or blade may be fulcrumed to the door near the hinge side thereof and its shorter arm connected to a runner or roller which rides on the ramp when the door is being opened, the rod, blade or the like being thereby rocked about its fulcrum to cause the finger to engage the keeper. Or the inner end of the link or blade may be arranged to engage a fixed cam when the door is being opened, the cam imparting a thrust which is transmitted to the finger which then drops to engage the keeper.

Preferably the keeper is in the form of a trough to receive the finger, the trough having a bridge towards one end thereof. When the finger is lowered it enters one end of the trough and sweeps any rubbish collected therein along the trough until it contacts with the bridge, the rubbish being discharged at the other side of the bridge.

A preferred embodiment of the invention will now be

described with reference to the accompanying drawings wherein:

FIGURE 1 is an elevation of the lower part of a plate glass door having fittings in accordance with the invention, the door being shown in its closed position;

FIGURE 2 is a section on the line **2—2** of FIGURE 1 and showing, in chain dotted lines, the door in its open position;

FIGURE 3 is an elevation, partly in section, to a larger scale of the door rail;

FIGURE 4 is an elevation of the lower part of the door stopped by the fittings in its open position;

FIGURE 5 is a section on the line **5—5** of FIGURE 4;

FIGURE 6 is a section on the line **6—6** of FIGURE 4;

FIGURE 7 is a view similar to FIGURE 6 but showing the door locked or held open by the fittings in its open position;

FIGURES 8 and 9 are views corresponding to FIGURES 1 and 4 respectively but showing an alternative construction of fitting in accordance with the invention;

FIGURE 10 is a section on the line **10—10** of FIGURE 9; and

FIGURES 11 and 12 are further views corresponding to FIGURES 1 and 4 respectively but showing a further alternative construction of fittings in accordance with the invention.

In the drawings like reference numerals denote the same or corresponding parts.

The invention will first be described with reference to FIGURES 1 to 7 wherein **10** denotes a plate glass door the foot of which is inserted in the upper channel **11** of an H channel bottom rail **12**. The door is supported by means of a lower vertical pivot pin **13**, and is also supported by an upper pivot pin, not shown. In the lower channel **14***a* is housed a rod **14** secured to a sleeve **15** rotatable on a pin **16** inserted through the bottom rail near the hinge side of the door. The extremity of this rod near the hinge side carries a roller **17**. A wire spring **18** encircles said sleeve one end of the wire bearing on the under side of the base of the bottom rail and the other end thereof engages the rod and tends to turn it in a clockwise direction as shown in FIGURE 3. The other end of the rod **14** is connected to a lug **19** projecting upwardly from the upper side of a finger **20** rigidly secured to a pivot pin **21** extending between the two flanges forming the lower channel of the rail.

Secured to the floor at the hinge side of the door is a ramp **22** up which the roller **17** runs when the door approaches its fully open position, which may be when it has been turned about 90°.

Sunk into the floor is a keeper in the form of a flanged trough **23** into which the finger projects when the roller rides on the ramp. This trough is provided with a bridge **24** near one end thereof.

When the door is swung to its open position, i.e. from the closed position shown in FIGURE 1 to its open position, the roller **17**, just before the door reaches its open position, rides on the ramp and is thereby raised against the action of its spring **18**. The rod is thereby rocked about its fulcrum, i.e. the pin **16**, and turns the finger **20** so that the latter projects into the trough **23**. The finger travels along the trough until it abuts against one side of the bridge **24**, further movement of the door being thereby arrested, see FIGURE 6.

Should any rubbish accumulate in the stop it is swept by the finger below the bridge to emerge from the trough at the other side of the bridge.

When the movement of the door is reversed the roller **17** runs down the ramp **22** and the rod **14** is rocked to

raise the finger **20** clear of the stop, the door being then free to close.

The position of the door when the finger abuts against the bridge of the stop is determined by the position of the ramp and the stop.

As the ramp is positioned near the hinge edge or stile of the door and the keeper or stop is sunk in the floor to be flush therewith there is no projection over which those entering and leaving the door can trip.

If desired the door may be provided with two ramps and two stops or keepers, one of the ramps and a stop or keeper coming into operation when the door is opened in one direction and the other ramp and stop or keeper coming into operation when the door is opened in the other direction.

If desired the pivot pin **21** to which the finger is rigidly secured may be provided with saw cuts or a hexagonal or square or recessed head or otherwise formed so that the pin can be rotated and therefore the finger raised and lowered manually by means of a suitable tool, the end of the finger having a claw which can engage both sides of said bridge **24**, see FIGURE 7. When such finger is raised and thereafter lowered to so engage the bridge the door is retained in its open position until the finger is again manually raised.

The invention is likewise applicable to banks of doors positioned between two doorposts, each door being capable of rotating through 140° or more.

In the embodiment of the invention shown in FIGURES 8 to 10 near the bottom pivot of the door is a fixed cam **22** and arranged to co-operate therewith is a roller **17** mounted on the end of the rod **14**. The other end of the rod is connected to the lug **19** rigidly secured to the finger **20** which is pivoted on a pivot pin **21** extending transversely of the bottom rail **12**. The rod is encircled by a helical compression spring **25** one end of which bears on a collar **26** fast on the rod while the other end of the spring bears on transversely extending pins **27**. A collar **28** fast on the rod limits the movement of the rod under the action of its spring. When the door is being opened, and just before it is fully opened, the rod **14** is displaced in a longitudinal direction against the action of the spring **25** by the roller **17** co-operating with the cam **22**. This causes the finger to turn about its pivot and engage the bridge of the keeper or stop sunk into the floor. The finger may be raised from its keeper by means of a key or other tool. When the door commences to close the spring moves the rod **14** to raise the finger clear of the keeper or stop. When the finger engages the bridge it may be raised and then dropped to engage the other side of the bridge to retain the door open.

In the embodiment of the invention shown in FIGURES 11 and 12 the rod **14** is mounted in bearings **14*a*** so that it can partake of a rotary movement about its own axis.

One end of the rod is cranked to engage with the cam **22** while the other end is cranked to engage with the end of the finger **20**. A blade spring **29** secured to the finger and bearing on the base of the channel in which the rod is inserted tends to raise the finger.

When the door is about fully opened the cam **22** co-operates with the adjacent cranked end of the rod **14** thereby turning the rod about its own axis. The other cranked end engages the finger **20** to turn it about its pivot against the action of the spring **29**, the finger then engaging the keeper or stop. When the door thereafter commences to close the finger is raised clear of the keeper or stop by the spring **29**, the rod being rotated about its own axis to its initial position.

The housing may be provided with two cams and two sockets provided to receive the finger, the cams and sockets being such that the door is held in its open position when opened inwards or outwards.

What I claim is:

1. A door provided with fittings comprising a keeper or stop sunk into the floor at a position remote from the hinge side thereof, a fixture in the form of a cam or ramp located at the hinge side of the door, a member carried by the foot of the door and actuated by the cam or ramp so that it engages with the keeper or stop when the door is opened.

2. A door provided with fittings comprising a keeper or stop sunk into the floor at a position remote from the hinge side thereof, a fixture in the form of a cam or ramp located at the hinge side of the door, a finger pivoted to the foot of the door and which, when lowered, engages with the keeper or stop, and means carried by the foot of the door and operated by the cam or ramp when the door is being opened, such means, when so operated, turning the finger about its pivot so that it engages the keeper or stop.

3. A door provided with fittings as claimed in claim 2 having a lever fulcrumed to the foot of the door near the hinge side thereof, one end of said lever being connected to the finger and the other end being operated by the cam or ramp when the door is being opened so that the finger is rocked thereby.

4. A door having fittings as claimed in claim 2 wherein the finger is connected to one end of a lever slidable axially in the foot of the door, the other end of the lever being operated by the cam or ramp so that it is displaced axially on the door being opened.

5. A door having door fittings as claimed in claim 1 wherein the keeper or stop is in the form of a trough having a bridge towards one end thereof.

6. Door fittings comprising a keeper or stop for insertion in the floor, a finger adapted to be carried by the foot of the door and arranged to engage said keeper, a cam or ramp adapted to be secured on the hinged side of the door and means operated thereby to actuate the finger.

References Cited in the file of this patent

UNITED STATES PATENTS

150,812	Baxter	May 12, 1874
558,786	Doyle	Apr. 21, 1896
881,725	Scott	Mar. 10, 1908
2,094,990	Lang	Oct. 5, 1937