

Sept. 12, 1967

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3,340,650

DOOR STRUCTURE

Filed Aug. 17, 1965

2 Sheets-Sheet 1

Fig. 1

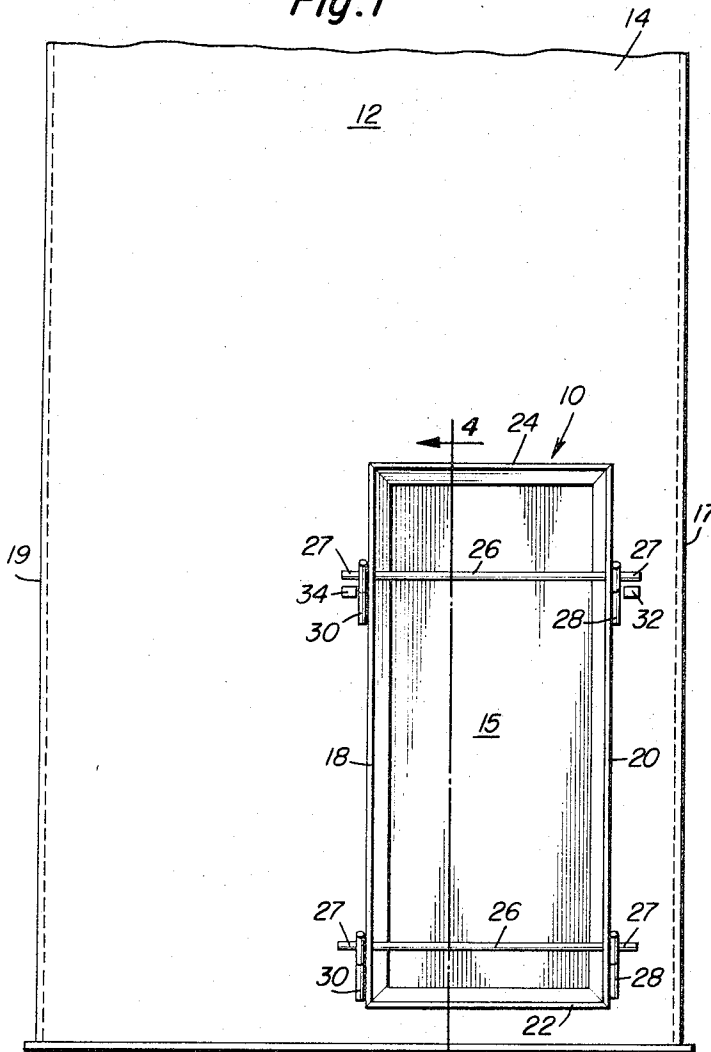


Fig. 2

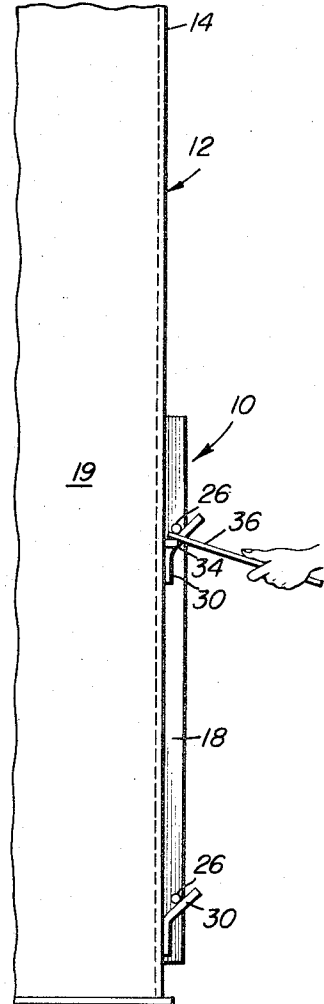
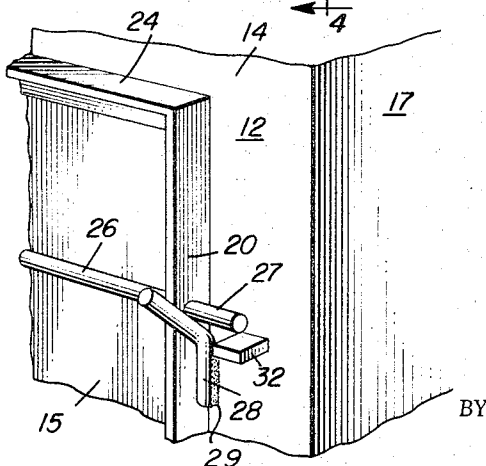


Fig. 3



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Fig. 4

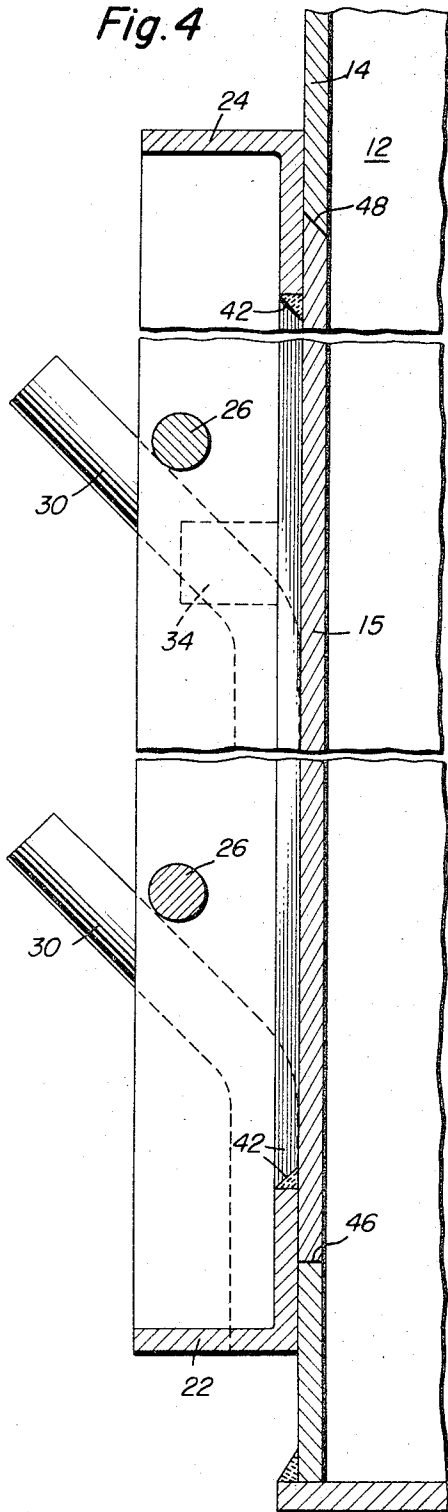
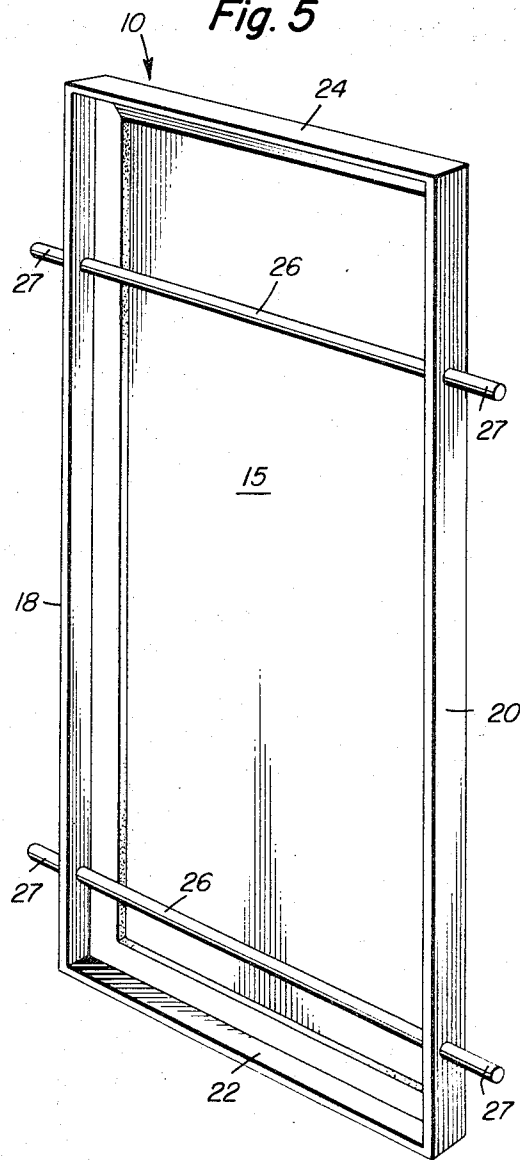


Fig. 5



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ABSTRACT OF THE DISCLOSURE

This invention is directed to a removable closure or access hatch arrangement for closing openings in structures such as grain elevators, mill enclosures, where fine powdery materials are processed. In such manufacturing plants, machinery is enclosed in housings to confine the dust from these fine powdery materials. It is essential that access doors be provided in these housings to permit access for maintenance and cleaning of the machine parts, and, at the same time, prevent the dust from reaching the machinery. To this end, therefore, an access door is provided in the form of a removable closure, which can be quickly and rapidly positioned in an opening in a structure or housing to tightly close the opening therein, and one which can be quickly removed from the opening to allow access to the interior of the structure or housing.

This invention relates generally to closures, and more particularly it pertains to an access hatch for structures such as grain elevators, mill enclosures and the like.

In the processing of feeds, fertilizers, flour, and the like, where fine powdery materials are handled, the machinery is enclosed in housings to confine the dust. Access doors are required in such housings to allow machine parts to be reached for occasional maintenance and cleaning and these must be tight fitting or dust will leak from the smallest cracks.

It is an object of this invention to provide a door structure designed especially for occasional access to the interior of dust covers of thin panelling where other doors are difficult to be fitted tightly.

Another object of this invention is to provide a hatch door arrangement simply and economically made from material removed to form the access aperture in a thin panel.

Still another object of this invention is to provide a simple clasp arrangement which will hold a hatch tightly closed under conditions of extreme vibration.

Yet another object of this invention is to provide a closure with keeper rods which also serve as handles.

In essence, this invention consists of a removable closure arrangement for an opening in a structure. It includes a door member including a sheet which is substantially the same size as the opening and which fits in the opening for closing the opening. The upper edge of the opening is provided with a bevel cut and the upper edge of the sheet is also provided with a complementary bevel cut to permit the sheet to move upwardly and outwardly with respect to the opening. A peripheral frame is mounted to the sheet and it extends beyond the edges of the sheet for engaging the structure. The door member is also provided with upper and lower rod means protruding from each side thereof. Cooperating upper and lower keeper means are secured to the structure adjacent the opening to define V-shaped spaces therebetween for urging the rod means toward the structure, such that the door is urged inwardly and downwardly into seating engagement with the opening upon installation therein.

Other objects and attendant advantages of this inven-

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tion will become more readily apparent and understood from the following detailed specification and accompanying drawings in which:

FIG. 1 is a front elevation of an elevator enclosure equipped with an access door incorporating features of this invention;

FIG. 2 is a side elevation of the elevator door arrangement of FIG. 1;

FIG. 3 is a fragmentary perspective detail of the door showing the clasp arrangement;

FIG. 4 is a much enlarged detail view taken on line 4-4 of FIG. 1; and

FIG. 5 is a perspective view of the door when removed from the elevator panel.

Referring now to the details of the drawings and particularly to FIGS. 1, 2, 4 and 5, reference numeral 10 indicates generally an access hatch or door. This door 10 is made from a rectangular sheet 15 obtained by cutting an aperture in the panel 14 of an elevator structure 12 having panel sides 14, 17 and 19.

A door frame consisting of structural L-shaped side members 18 and 20 and bottom and top members 22 and 24 is welded together and secured to the sheet 15 by welds 42 so that it overlaps the periphery thereof as shown in FIG. 4.

A pair of rods 26 in spaced relation are passed horizontally through opposing holes made in the side members 18 and 20 and welded there so as to provide protruding ends 27 on each side as best shown in FIG. 5.

Two pairs of spaced keepers 28 and 30 are secured by welds 29 to the panel 14 of the elevator 12 and these keepers 28 and 30 are bent at 45 degrees outwardly at their upper halves and positioned so as to capture the rod ends 27 when the door 10 is in the closed or installed position as shown in FIGS. 1, 2 and 3.

As shown in FIG. 4, with this construction the sheet 15 fits snugly back in its original location in the panel 14. Further the door frame (members 22, 24 etc.) is urged tightly thereagainst by the keepers 28 and 30 bearing against the rods 26 so there are no gaps exposed around the sheet 15 at area 46 even if the material of the panel 14 is thin flexible material.

If the material of the panel 14 is thick, a bevel cut as shown at area 48 is used to sever the door sheet 15 from its parent panel 14.

If the door is large and heavy the removal is facilitated by means of fulcrum blocks 32, 34 positioned alongside the keepers 28 and 30, respectively, and secured to the panel 14 as shown in FIG. 3. With the aid of a pry rod 36 as shown in FIG. 2, the door is then easily jacked upward and outward and then removed using the rods 26 as handles.

Obviously many modifications and variations of the present invention are possible in light of the above teachings. It is, therefore, to be understood that within the scope of the appended claims the invention may be practiced otherwise than as specifically described.

What is claimed is:

1. A removable closure arrangement for an opening in a structure, comprising, a door member including a sheet which is substantially the same size as said opening and fits therein for closing said opening, the upper edge of said opening having a bevel cut and the upper edge of said sheet having a complementary bevel cut to permit the sheet to move upwardly and outwardly with respect to said opening, and a peripheral frame mounted to said sheet and extending beyond the edges thereof for engaging said structure, said door member having upper and lower rod means protruding from each side thereof, and cooperating upper and lower keeper means secured to said structure adjacent said opening and defining V-shaped spaces therebetween for urging said rod means towards

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said structure, whereby said door is urged inwardly and downwardly into seating engagement with said opening.

2. A removable closure arrangement for an opening in a structure, comprising, a door including a sheet member for closing said opening, the upper and lower edges of said opening having a bevel cut and a perpendicular cut, respectively, and the upper and lower edges of said sheet having corresponding complementary cuts which permit said sheet to move upwardly and outwardly, a frame mounted to the exterior surface of said sheet member and extending over its periphery for engaging said structure, vertically spaced rods secured horizontally to said frame and substantially parallel to said sheet and having their ends protruding beyond each side of said frame, and a plurality of cooperating keeper elements mounted to said structure adjacent said opening, each of said keeper elements defining a V-shaped space with said structure for receiving one of said ends of said rods and urging said one end towards said structure, whereby said

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door is urged inwardly and downwardly in seating engagement with said opening.

3. The removable closure arrangement of claim 2, and additionally means for jacking said one end upwards and outwards from said V-shaped space.

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