

[54] CONTAINER CLOSURE FASTENING MEANS 3,464,729 9/1969 Chambers 292/218
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[57] **ABSTRACT**

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A fastening means for the outwardly opening doors on the end of a box-like refuse container adapted to be transported on a truck back for dumping of refuse material therefrom. In order to prevent injuries to operators of the fastening means during unfastening of the latch on the doors a remote lever arm is provided with an attachment to an eccentrically mounted fastening member capable of latching with a hook means fixed to one of a pair of doors, the fastening member, eccentric and lever means being rotatably mounted to the other of said pair of doors.

[52] U.S. Cl. 292/7; 292/DIG. 32; 292/DIG. 49

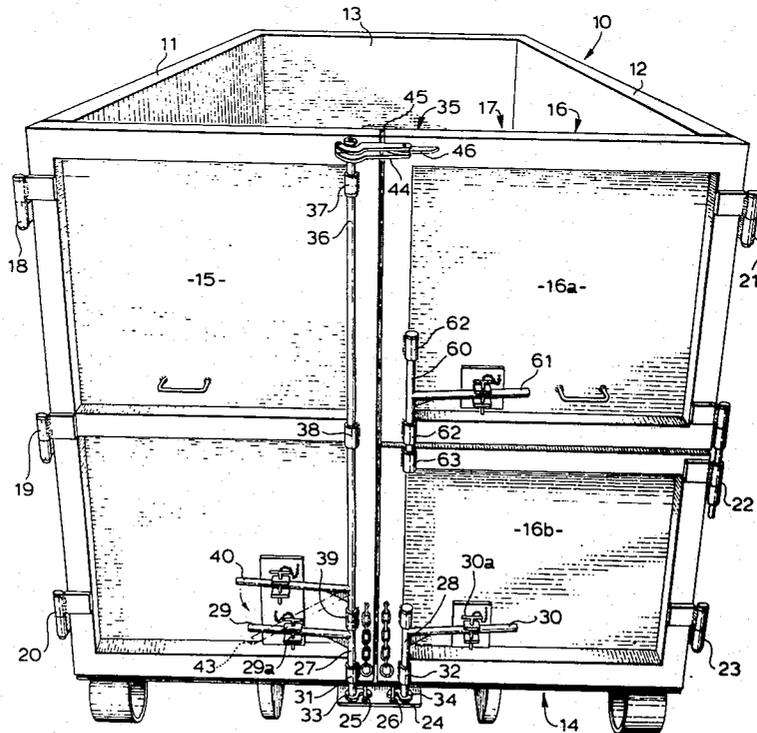
[51] Int. Cl.² **E05C 9/08**

[58] Field of Search 292/7, 57, 218, 247, 113, 292/DIG. 49, DIG. 32

[56] **References Cited**
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7 Claims, 10 Drawing Figures



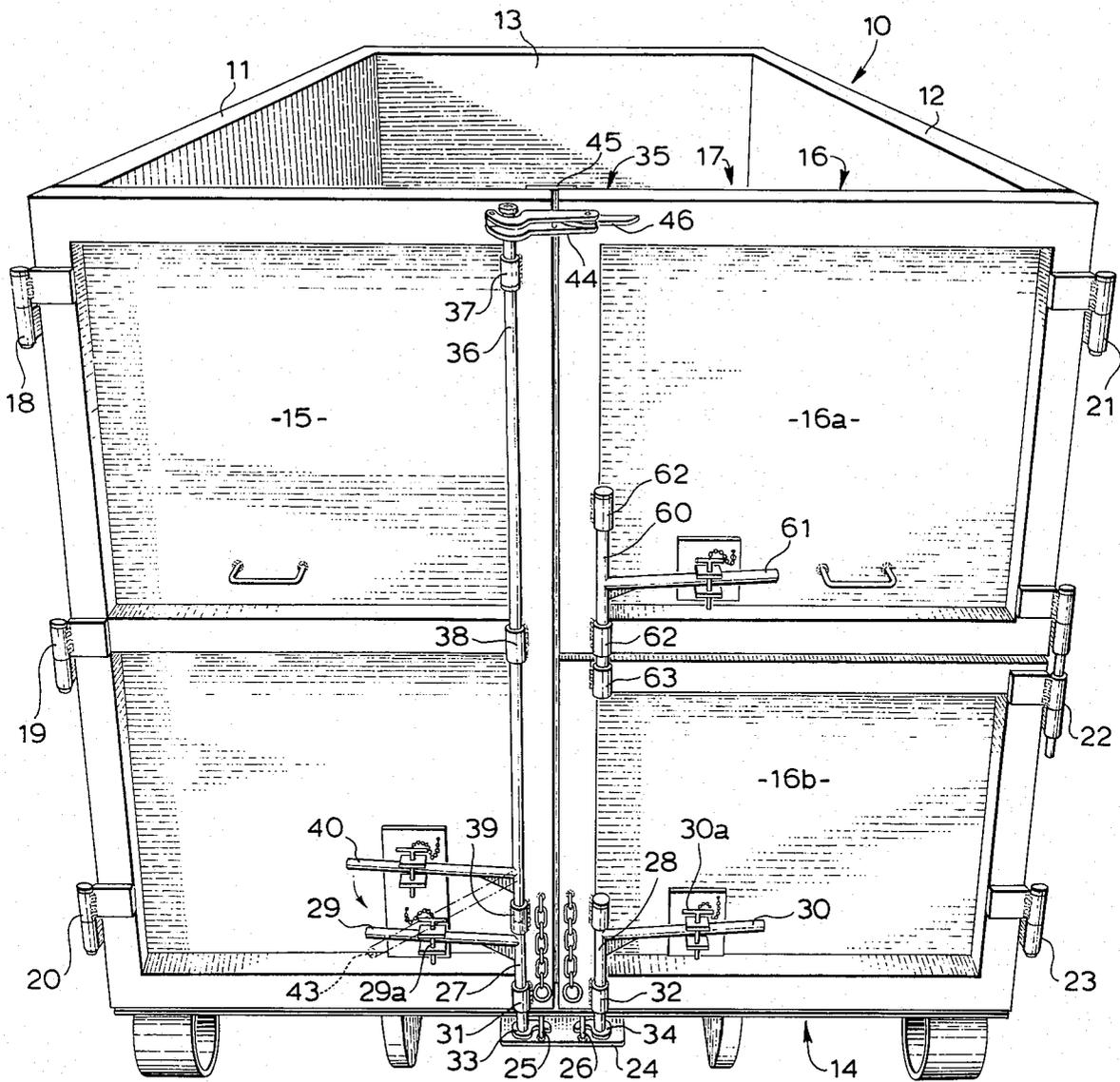


FIG. 1

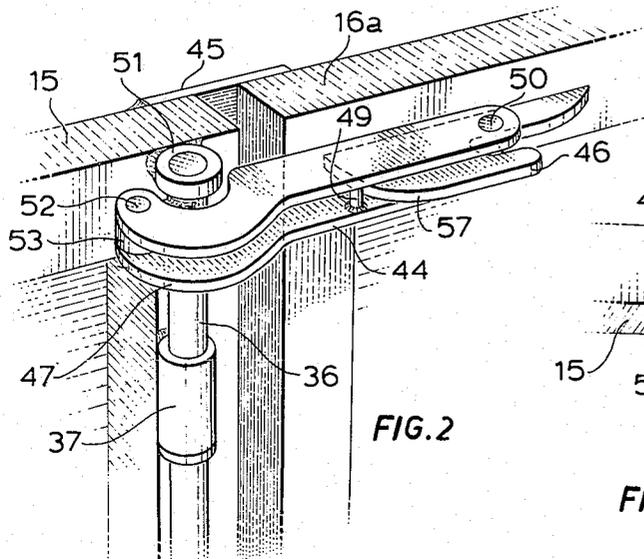


FIG. 2

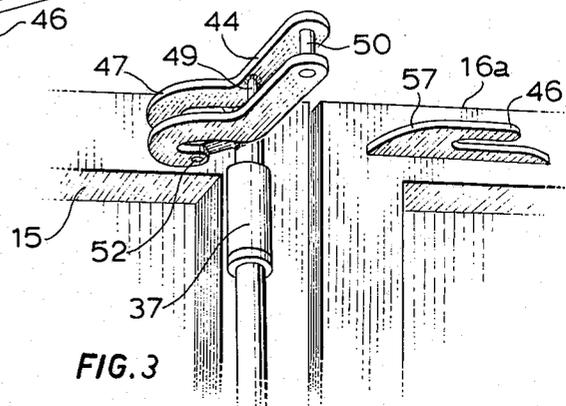
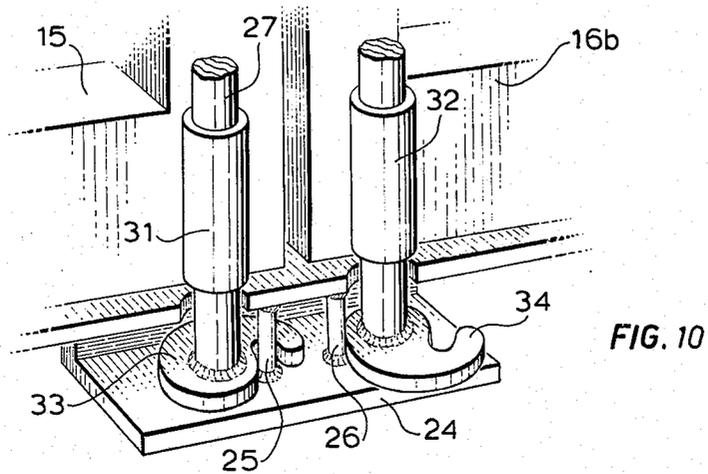
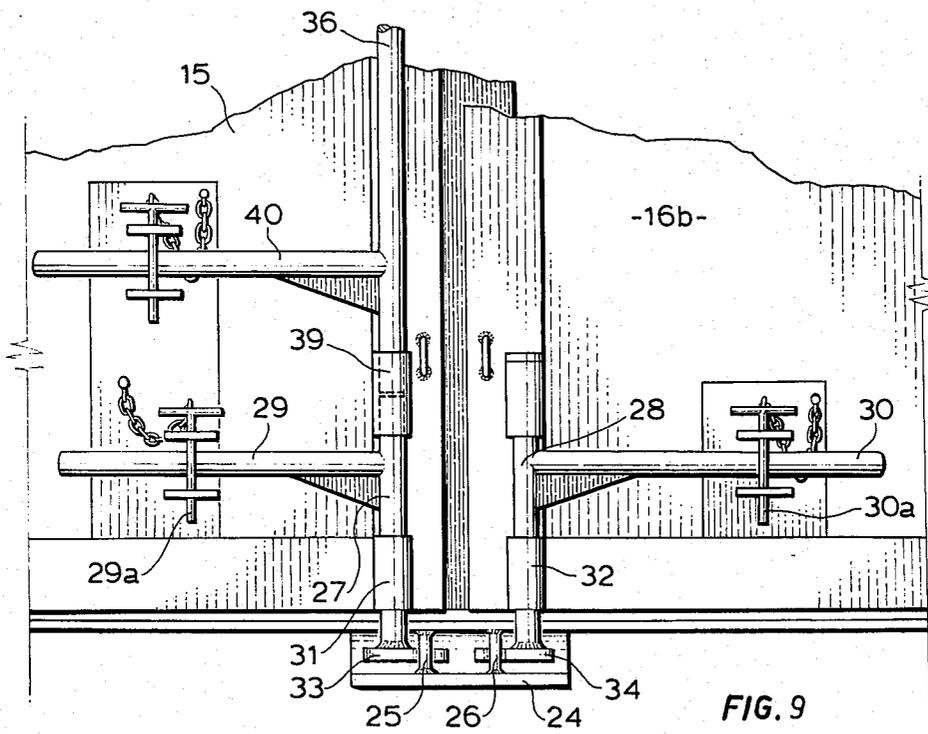
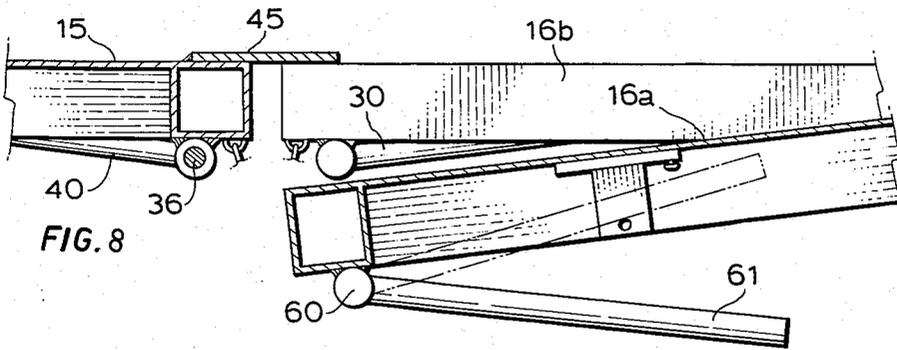


FIG. 3



CONTAINER CLOSURE FASTENING MEANS

The present invention relates to a fastening mechanism for securing the doors of a refuse container.

In particular the following specification discloses a latching arrangement for the pair of outwardly opening doors on the end of a box-like container employed to receive refuse.

BACKGROUND OF THE INVENTION

It is known that the most convenient method of storing and containing refuse prior to removal from a factory or building site, is to provide a large box-shaped container at the factory or site, which can be lifted or tilted onto the back of a truck frame. The container is made of a size similar to a truck box so that it will completely fill the rear frame of the truck. The container has various means of securing it to the frame of the truck which carries it away to a dump for deposit therefrom. The container is usually open at the top and has a fixed floor and three side walls. The fourth and end wall is divided into a pair of outwardly hinged doors secured together in the closed position by latch means at the top and bottom. At the top of the container the doors are usually latched one to another but at the bottom the doors are in most cases fixed to the bottom of the container, and sometimes to one another, as well.

The refuse can be deposited into the container over the sides and ends or in the case of heavy material such as scrap metal, by opening the doors and by placing the refuse object on the bottom floor. It has been found, however, that it is a human tendency to place heavy objects near to the opening and to throw lighter refuse toward the end fixed wall such that when filled, the container will have most of the heavy objects close to the doors. The above fact leads to the most unsatisfactory result that as the container is lifted onto the truck and during transit to the dump the heavy objects will roll or shift toward the doors and bind against them there. The binding of the refuse against the doors thereby puts an undue stress upon the latching mechanism. This in turn often causes great difficulty to the operator when he wishes to unlatch the doors and dump the refuse. In particular the upper latch poses serious problems. It has been found that operators have been injured severely by the necessity of climbing onto the container and straddling the load to release the upper latch from above and then falling with the load when the latch gives way. The fact that the usual latch employed to secure the doors is only releasable by reaching down from the load or up from outside has proved most unsatisfactory from a work safety standpoint and many serious injuries have occurred to operators being struck by heavy objects falling from the container as they climbed the doors to release the top latch.

BRIEF SUMMARY OF THE INVENTION

It is the object of the present invention to provide a latch fastening means for the outwardly opening doors of a refuse box, that is operable by remote means and that permits release of the latch by an operator standing remote from said container. More particularly it is an object of the invention to provide a container with a top latch mechanism which is provided with such remote operating means, and is preferably separate from the lower latching means.

It is a further object of the invention to provide a container with a semi-height door, or "stable" door, divided into upper and lower halves, so that refuse can be thrown into the container more easily.

Latching will also be provided between the upper and lower door halves so that they may be fastened together and swing in unison.

A refuse-box herein provided comprises a pair of outwardly swingable doors each having a parallel side adapted to fall substantially flush one with another when said doors are in the enlined and refuse-box, enclosing position. Each door has a bolt and hook means attached to its lower side for engagement with a pin means fixed between the bottom of said refuse-box and an angle plate member fixed to said bottom of said refuse-box. A stop plate is fixed to the top inside back edge of one door to extend outwardly toward the other door to thereby assist in enlining the two doors one with another when both are in the closed position.

The pair of abutting and aligned doors are fastened together at the top by a hook member to the door, being engaged by an eye member that is eccentrically rotatably mounted to a bolt rotatably mounted to the other door. A lever arm is provided to an extension of said bolt in order that the eye can be engaged and disengaged by an operator standing in front of, and below the closed doors.

By being eccentrically mounted to the bolt, the eye of the latch can be pushed outward from the wall of the door simultaneously with a movement out of engagement with the hook, thereby allowing the eye to clear the hook.

The above objects of the invention will be more clearly understood and appreciated from a perusal of the accompanying drawings wherein;

FIG. 1, is an end perspective of an open, four-sided refuse container having a pair of outwardly opening doors wherein the bottom latch means, and the top latch means, for the doors are shown in fastened position;

FIG. 2, is an enlarged view of the top latch in closed position;

FIG. 3, is an enlarged view of the top latch in open position;

FIG. 4 is a top plan view of the rear door and upper latch mechanism;

FIG. 5 is a view similar to FIG. 4 showing the opening of the latch mechanism;

FIG. 6 shows a further stage of the opening of the latch mechanism;

FIG. 7 is a rear perspective showing a detail of FIG. 1;

FIG. 8 is a top plan view showing one door partly opened;

FIG. 9 is a rear elevational view of the lower latching mechanism, and,

FIG. 10 is a perspective of the lower latching mechanism.

DESCRIPTION OF A SPECIFIC EMBODIMENT

In the FIG. 1, a box-shaped refuse container 10, is shown having solid side and end walls 11, 12, and 13 and bottom 14 (not shown). A pair of doors 15, 16, enclose end 17, of the container. Door 15 is swingable outward by hinges 18, 19, 20, attached to side wall 11, and door 16 is swingable outward by hinges 21, 22, 23 attached to side wall 12.

An angle plate 24 is attached to and extends downwardly from the bottom 14, of the container and two catch pins 25, 26 are attached between the plate 24, and the bottom 14. In this way they are protected from damage caused by dumped refuse. Lock rods 27, 28 are rotatably mounted to the lower side of doors 15, 16 respectively. Each rod 27, 28 has a lever arm 29, 30 respectively attached to it to cause rotational movement. Rods 27 and 28 are rotatably mounted in sleeves 31, 32, respectively. Catcher 33 and 34 are fastened to respective rods 27, 28 and rotate therewith in unison, into and out of locking engagement with respective pins 25, 26.

When arm 29 is pulled outward from the door 15, the rod 27 turns in sleeve 31 releasing catch 33 from catch pin 25, thereby freeing the bottom portion of door 15. Similarly when arm 30, is pulled outward from door 16, the rod 28 turns in sleeve 32, releasing catch 34, from catch pin 26, thereby freeing the bottom portion of door 16. Any suitable retaining means such as the releasable pins 29a and 30a may be provided for securing the arms 29, 30 as shown

The top latch means 35, is operated by a rod 36 extending downwardly along the outer side of the door 15, and rotatable in sleeves 37, 38, and 39. A lever arm 40 is attached to the lower end of rod 36 and is moveable outwardly from rest position in direction of arrow 42 to positions exemplified by position 43 in dotted line form, to rotate rod 36.

The top latch means 35 is shown in detail in FIGS. 2, and 3. Plate 45 is fixed to inside of door 15 to protrude towards door 16 and provides a stop means for door 16 to assist in aligning the doors 15 and 16.

A fastening member or eye member 44 is shown in FIGS. 2, and 3 attached to the upper end of rod 36. It will be seen to be formed by two sickle shaped members 47, 48 spaced apart by two cylindrical pins 49, 50 thereby forming the eye 44 of the catch 35. A hook member 46 is attached to the upper edge of door 16 as shown in alignment with eye 44.

The rod 36 is rotatable in bushing 51 and the eye 44 of catch 35 is rotatably mounted on bolt 36 by pin 52 protruding from the eccentric arm 53 fixed to rod 36 proximate its end near bushing 51. When rod 36 is rotated by lever arm 40, the eccentric arm 53 rotates with it carrying the eye 44 outward from door 15 and toward door 16.

In FIG. 4, the lever arm 40 is shown in dot-dash-line with arrows 54, 55, 56 indicating the movement of the arm 40 and eye 44.

The hook member 46 has a curved camming surface 57 proximate the door edge 58 of door 16.

Assuming the latch 35 is in the locked position as shown in FIGS. 1 and 2, the releasing takes place by rotating the rod 36 by swinging arm 40 away from door 15. As the rod 36 is rotated it carries the eccentric arm 53 and eye 44, toward the hook 46, and causes pin 50 to move out of engagement with hook 46. Further rotational movement of rod 36 will cause the pin 46 to engage the cam surface 57 and as the pin 49 rides along the cam surface 57 of the hook 46 it lifts the eye 44 clear off the hook and moves holding pin 50 outward from the door 16. The arc of movement imparted to the eye 44 by arm 53 initially moves the eye 44 outward from the door 16 and as arm 53 is rotated further it draws the eye into contact with the door causing the catch pin 50 to swing further away from the hook 46.

The arm 40 is then swung back to impart reverse rotation to shaft bolt 36 and the eye 44 is pulled clear of the hook 46 thereby releasing the top catch combination. Freeing the doors is completed by releasing the bottom bolts 27, 28, allowing the refuse to be dumped.

To allow an operator even greater clearance from the opening doors, a length of pipe can be fitted over arm 40, and the lever and shaft bolt combination, can be operated from a position well back from the doors. Closing of the fastening means is achieved by again swinging the arm 40 away from door 15. In this case the action is somewhat more rapid and produces a "whipping" or wrist action of the eye 44 so that it swings round into engagement with the hook 44.

In the commonly used refuse containers a bar or strut is attached across the ends of the upper corners of the sides adjacent the dumping opening to provide rigidity to the structure as a whole. The bar or strut prevents the sides from deforming when the container is being carried loaded to the dump and also relieves the fastening means and the doors from undue stress. Without such a support bar it was often found that the conventional closure mechanism was put under such stress that it broke or became so tight that it could not be released without first removing the weight of the refuse from against the ends and the doors, which action of course defeats the purpose of the doors.

It is therefore, another advantage of the present invention that it provides a fastening means that has of itself sufficient strength to hold the sides together but will not itself bind tight and be unfastenable when the container is closed, full and in transit. The fastening means provided herein is rather designed and shaped to utilize the bulging tendency of the sides to assist the action of the opening operation.

By eliminating the bar or strut from across the top end of the container it will be readily appreciated that an obstruction across the dumping end of the box is removed and over-full loads will empty more easily.

As will be apparent from the drawings the present invention is constructed of rugged materials with the usual and known skill in the art. However, it is hereby noted that the arm 53 and pin 52, are machined to a relatively close tolerance for this type of equipment in order that the arm 53 and pin 51 interfit snugly and run smoothly one with another. It is important for the successful remote operation of the closure means that a smooth and controlled movement of the arm 40 and eye 44 is achieved. The operator of the remote arm 40 must learn to 'whip' the eye over the hook by utilizing the momentum of the heavy, and massive eye as it travels toward the hook. The momentum carries the eye past the end of the hook but the mass of it helps to catch the eye in the hook as the operator gives a quick return pull or whip to the lever which has the resultant action of drawing the pin 50 over hook 46. In order to provide the operator with a controlled movement to the linkage a machine fitted pin and arm combination is required. A skilled operator can latch the device with one remote throw or whip of the linkage combination but most persons can accomplish a latching of hook and eye with two or three throws. It is necessary for this purpose that the eye portion of the linkage be relatively massive and the arm 53 and pin 52 be not sloppily interfitted. Advantageously the door 16 can be built as a "stable" type door in upper and lower halves 16a and 16b as shown in FIG. 1. In this case a further locking

rod 60 and arm 61 is provided, slidable upwardly and downwardly in sleeves 62. A locking sleeve 63 is provided on door half 16b.

From the foregoing, it is believed that the objects, advantages, construction and operation of the invention will be comprehended by persons skilled in the art. It is understood that the invention is not to be limited to the precise details and depiction furnished herein, but is to be accorded the full scope of the appended claims.

What I claim is:

1. Fastening means for use with a pair of doors hingedly opening away from one another, wherein each of said doors has a hinged side and an oppositely disposed free edge, said free edges meeting when said doors are closed, said fastening means comprising;

a hook member fixed adjacent to the free edge of one of said pair of doors, and directed away from said free edge of said door;

camming surface means between said hook member and the free edge of said door;

rod means rotatably attached adjacent the free edge of the other of said doors;

an eye means for engaging said hook member swingably mounted on said rod means in registration with said hook member and moveable between hook engaging and disengaging positions;

pin means on said eye means oriented to engage said camming surface means for procuring swinging movement of said eye means relative to said hook means, and,

operating means fixed to said rod means to rotate the same and thereby move said eye means into and out of engagement with said hook member.

2. Fastening means as claimed in claim 1, wherein said eye means comprises an offset arm fixed perpendicularly to said rod means and a pair of sickle-shaped members linked together and spaced apart by a pair of pin members to form the hook engaging eye means, one of said pin-members being rotatably mounted through said arm for rotatably supporting said sickle members thereon to provide, with said arm, movement of said eye about said rod means.

3. Fastening means as claimed in claim 1, wherein

said container is formed as an open topped box with a fixed bottom and side walls and an opening, and wherein the doors are mounted adjacent the opening, and wherein said hook and eye means are attached toward the upper edges of said doors, and including locking means attached near the lower edges of each door, and latch means fixed to said container to cooperate with said locking means for fastening the lower edges of said doors.

4. Fastening means as claimed in claim 1, having a stop plate protruding outwardly from one door toward the other door to provide a means of aligning the top edges of the doors together;

and having the operating means extendable outwardly from adjacent the lower edge of said the other of said doors to permit remote unhooking of said eye from said hook by an operator without reaching up to the top edge of said container.

5. Fastening means as claimed in claim 3 wherein said lower fastening latching means includes locking pin means on said container, and swingable hook members rotatable into and out of engagement therewith, said hook members being operatively connected to said rod means.

6. Fastening means as claimed in claim 3 including one of said doors incorporating upper and lower door halves, swingable separately from one another, and means for locking said door halves together for swinging in unison.

7. Fastening means as claimed in claim 1 wherein said hook means and said camming surface are formed as an integral unit, the camming surface being the outer profile and the hook means the inner profile of the same member, and wherein said eye means comprises a pair of spaced apart sickle-shaped members, and three spaced apart pin members uniting said sickle-shaped members, one said pin member at one end thereof being rotatably connected to said rod means, another said pin member at the other end thereof engaging the hook means, and the third said pin member being located between the two pin members aforesaid and engaging said camming surface as aforesaid.

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