

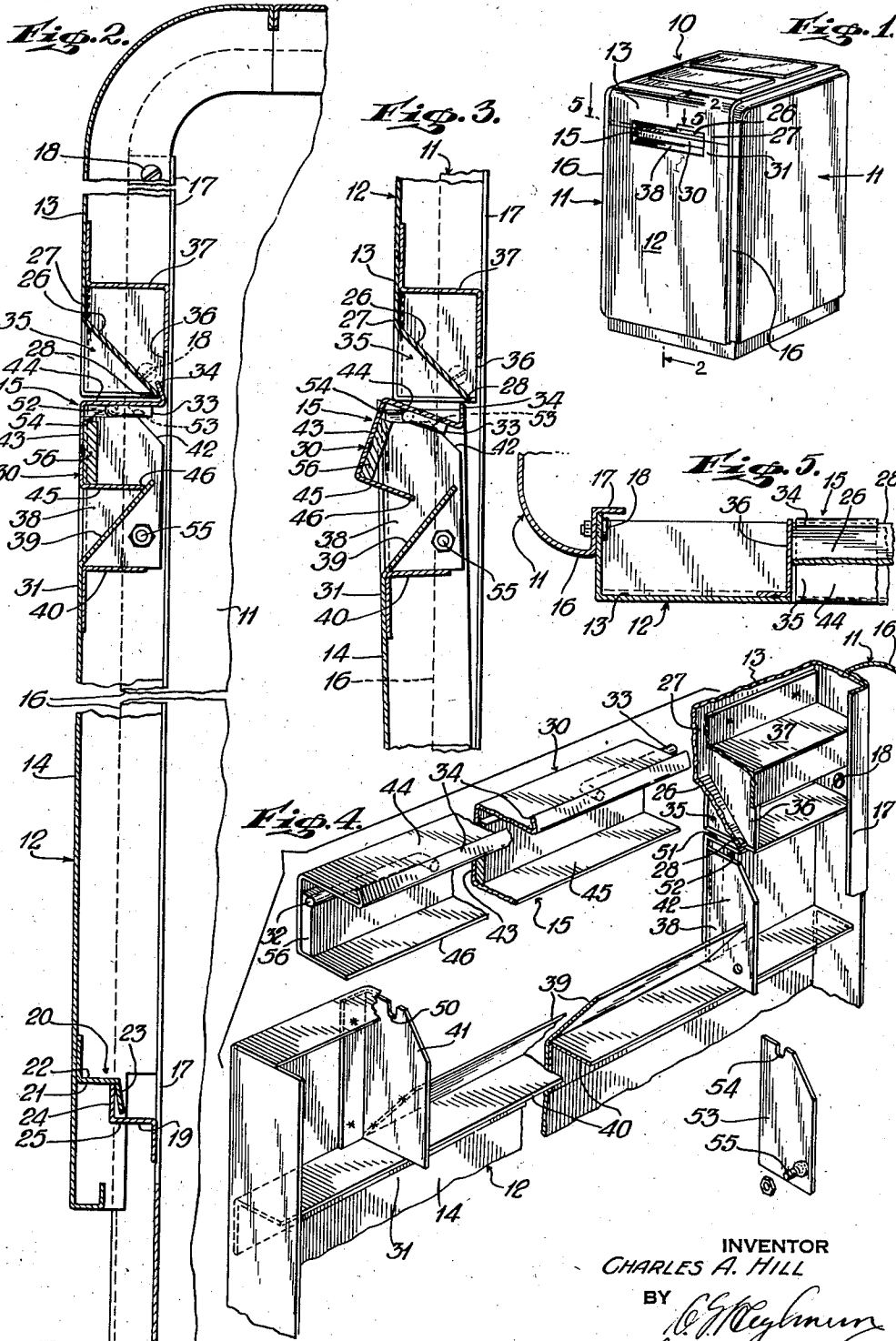
May 18, 1943

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2,319,403

WALL STRUCTURE

Filed Dec. 16, 1941



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2,319,403

WALL STRUCTURE

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Application December 16, 1941, Serial No. 423,145

9 Claims. (Cl. 189—34)

This invention relates to wall structures and including latching mechanisms for securing movable wall sections or doors to the stationary or other parts of such wall structures, and has for an object to provide a wall structure of the type specified which is of improved construction and arrangement of parts.

The invention consists in the novel construction and combination of parts, to be more fully described hereinafter, and the novelty of which will be particularly pointed out and distinctly claimed.

In the accompanying drawing, to be taken as a part of this specification, I have fully and clearly illustrated a preferred embodiment of my invention, in which drawing—

Fig. 1 is a perspective view showing a sheet-metal furnace jacket, or enclosing wall, in which the present invention for purposes of illustration, is embodied;

Fig. 2 is a fragmentary vertical section taken on the line 2—2 of Fig. 1, the view showing the structure on an enlarged scale;

Fig. 3 is a fragmentary vertical section like Fig. 2, and shows the relative position of the parts when the door, or movable wall section, is being opened, or just before it is closed;

Fig. 4 is a fragmentary exploded view, showing on an enlarged scale, and in perspective, the top of the door from the inside of the jacket and showing a pivoted latch member and its keeper plate as removed from the door, and also showing in perspective a fragment of the stationary parts of the furnace jacket; and

Fig. 5 is a fragmentary plan section taken on the line 5—5 of Fig. 1, the parts being shown on the same enlarged scale as Figs. 2, 3, and 4.

Referring now in detail to the preferred embodiment of my invention which I have elected to show in the drawing, the reference numeral 10 indicates, in its entirety, an enclosing sheet-metal wall structure, or jacket, for a warm air furnace. The numeral 11 indicates the fixed sheet-metal side walls of the jacket 10, and the numeral 12 the sheet-metal vertical front wall of the jacket. The front wall 12 is divided transversely along a horizontal line to provide an upper fixed panel or wall section 13, and a lower outwardly movable panel or wall section 14, the latter serving as a door for permitting access when desired to the interior of the furnace, said panels being in substantially the same vertical plane when the panel 14 is in closed position relative to the panel 13. The door panel 14 is secured in its closed position by a latching mechanism indi-

cated in general by the numeral 15 and located at the top of the door panel.

While I have shown my invention as embodied in a furnace jacket, it is not to be considered as being limited in all of its aspects to this particular application; for the invention according to certain of its broader aspects, may be embodied in any type of wall structure having a removable panel or wall section to be secured in closed position to the relatively fixed parts of such wall structure by a latching mechanism.

Each of the sheet-metal side walls 11 is formed with a curved forward edge 16 which terminates in a vertical flange 17. The two flanges 17 of the two side walls extend toward one another from opposite sides of the jacket and provide abutments, against which the front wall 12 fits. The upper fixed panel 13 is secured along its two vertical side edges to the curved forward edges 16 by suitable screws or bolts 18, and thus the fixed panel provides a rigid connection between the side walls 11 at the upper part of the front wall 12. At the lower part of the front wall, the two side walls are rigidly connected by a cross-piece in the form of a Z bar 19 which is spot-welded at its ends to the vertical flanges 17.

The Z bar 19 forms the lower part of a two part separable hinge 20 connecting the lower part of the door panel 14 with the fixed parts of the jacket. The other part of the separable hinge 20 is provided by a Z bar 21 extending horizontally across and spot-welded to the inner surface of the lower part of door panel 14. The Z bar 21 comprises an outwardly extending flange 22 and a downwardly extending flange 23 in overlapping engagement with an upwardly directed flange 24 and flange 25 of the Z bar 19. When the latch mechanism 15 is disengaged or unlatched in a manner which will be presently describe, the door panel 14 may be moved outward of the jacket 10 about the hinge 20 until the top of the door panel 14 clears the fixed upper panel 13 and then, if desired, the door panel may be removed entirely by simply lifting the same and thereby disengaging the flanges 22, 23, 24, and 25 of the Z bars 21 and 19.

The latch mechanism 15 comprises a catch plate 26 formed rigid with and arranged lengthwise along the lower marginal portion 27 of the top panel 13, and sloping downward and inward to provide an inner free edge portion 28 which extends in the same general direction as the line of division between panels 13 and 14. The plate 26 may be integral with the panel 13, as is shown in Figs. 2 and 3. The latch mechanism 15 also

comprises a pivoted latch member 30 arranged lengthwise along the top or upper marginal portion 31 of the door panel 14 and pivotally connected by pins 32 and 33 to the door panel 14 so as to move about an axis extending in the same general direction as the free edge portion 28. The pivoted latch member 30 includes an upwardly directed hooking flange 34 disposed inwardly of the pivot and extending behind and engaging the rear of the free edge portion 28 when in the latched position (see Fig. 2). When it is desired to open and remove the door panel 14 the hooking flange 34 is first moved downward by hand about the pivotal axis provided by the pins 32 and 33, until the flange 34 clears the free edge portion 28 (see Fig. 3).

As shown in Fig. 1 the catch plate 26 is centrally disposed with respect to the horizontal division line between panels 13 and 14 and extends for a substantial distance along that line. The catch plate forms the rear wall of a downwardly and outwardly opening recess 35. The end walls of the recess are formed by angle clips 36 suitably fixed as by spot-welding to the rear face of the marginal portion 27. The two side edges of the catch plate 26 are secured to the angle clips 36 by spot-welding. The catch plate 26 may be advantageously formed by cutting the same out of the upper fixed panel 13 and then by bending it inward to the position shown. The lower marginal portion 27 is suitably stiffened by a Z bar 37 extending horizontally across the inner surface of the marginal portion 27 and suitably secured thereto by spot-welding.

The upper marginal portion 31 of the door panel 14 is formed with a recess 38 which opens outward and upward toward the fixed panel 13. The recess 38 is in juxtaposed relation to the recess 35 and extends for the same distance along the division line between panels. The recess 38 is defined partly by a rear wall 39 which slopes upward and inward from the outer surface of the door panel 14 at the same angle preferably as the catch plate 26 slopes downward and inward from the fixed panel (see Fig. 2). The rear wall 39 is formed preferably by cutting the same from the upper marginal portion 31 and then bending the same inward along a horizontal line as shown. The marginal portion 31 is stiffened by an angle 40 extending horizontally thereacross at the bend of the wall 39 and secured thereto by spot-welding. Angle clips 41 and 42 form the two end walls of the recess 38 and are fixed to the inner surface of the upper marginal portion 31 by spot-welding.

The latch member 30 extends horizontally across the upper part of the recess 38 and is so positioned that when in normal latched position (see Figs. 1 and 2) it is substantially midway between the rear sloping walls 26 and 39 of the recesses 35 and 38, respectively. Such an arrangement is desirable in that it is neat and pleasing in appearance. The latch member 30 is also advantageously formed of sheet-metal and is channel-shaped or U-shaped in cross section, said member comprising a first side plate 43 which lies substantially flush with the front wall 12 when in latched position, a second side plate 44 extending rearwardly from the upper horizontal edge of the plate 43, the hooking flange 34 extending upwardly from the rear edge of the plate 44, and a third side plate 45 extending rearwardly from the lower horizontal edge of the plate 43 such a distance that its rear edge 46 engages the wall 39 of the recess 38 when the

latch member is in latched position (see Fig. 2). The plates 44 and 45 lie in substantially parallel planes at right angles to the front plate 43.

The pivot pins 32 and 33 are aligned with respect to one another and are suitably fixed by spot-welding to the under surface of the side plate 44, said pins extending outwardly from opposite ends of the plate 44 and being journaled, respectively, in the two end walls of the recess 38. As shown, the top of the angle clip 41 is provided with a bearing opening 50 which receives the pin 32. The angle clip 42 is cut away at its top so as to form with the adjacent end of an overhanging top edge 51 of the door panel 14, a slot 52 into which the other pivot pin 33 may be inserted from the rear side of the door panel (see Fig. 4). A keeper plate 53 is formed in its top edge with a bearing opening 54 which receives the pin 33, and the keeper plate is detachably secured by a bolt 55 to the angle clip 42. This construction provides a simple and effective means for pivotally and detachably mounting the latch member 30 in the recess 38.

Preferably the latch member is constantly biased toward the latching position as shown in Fig. 2. This is effected in the present construction by adding weight to the side plate 43 which is on the side of the pivot pins 32 and 33 which is opposite the hooking flange 34. The weight is shown as being a metal bar 56 suitably spot-welded to the inner surface of the plate 43 and substantially coextensive therewith. The plate 45 by engaging at its inner edge 46 with the wall 39 when in latched position, serves as a stop which in conjunction with the weight 56 assures that the plate 43 will be kept in flush relation with respect to the plane of the front wall 12, and thereby maintaining the neat and pleasing appearance of the latching mechanism.

As stated, Fig. 2 shows the relationship of the parts when the door panel is in closed or latched position. The hooking flange 34 is shown as being in engagement with the rear of free edge portion 28 and the door panel is held thereby in its closed position. The plate 43 is flush with the front face of the wall 14 and remains in this position by virtue of the weight 56 and the plate member engaging the rear wall 39. When it is desired to open the panel 14, one grasps the plates 44 and 45 with the thumb and fingers and moves the latch member 30 about its pivotal axis of support until the hooking flange 34 clears the free edge 28. The unlatched position of the parts is shown in Fig. 3. The door may then be pulled outwardly until the marginal portion 31 is out from under the marginal portion 27, and the door may then be removed by lifting the same and thus disengaging the flanges 22 and 23 of bar 21 from the flanges 24 and 25 of bar 19. When it is desired to replace and close the door 14, it can be simply and readily effected by positioning the lower part of the door with its side edges between forward edges 16 of walls 11 with the flanges of bars 21 and 19 in engagement and then by moving the door panel about the hinge 20 toward closed position. The latch member 30 is moved about its axis so that the hooking flange 34 will clear the free edge 28 and the door is pushed inward until the sides thereof firmly engage the vertical flanges 17. The latch member 30 may then be released and the hooking flange will move upward and into latching engagement with the free edge portion 28.

What I claim and desire to secure by Letters Patent of the United States is:

1. An upright sheet-metal wall divided transversely to provide an upper fixed panel and a lower movable door panel, the upper panel having a recess extending across the lower part thereof and defined partly by an inward and downward inclined rear wall terminating in an inner free edge portion extending across the lower part of said upper panel; said lower door panel having a recess extending across the upper part thereof and disposed opposite said first-named recess; a latch member extending lengthwise across the recess in said lower panel and pivoted to move about an axis extending in the same general direction as said inner free edge portion and including an upstanding hooking flange disposed inward of the pivot and extending lengthwise in the same general direction as said free edge portion of the upper panel and fitting behind and engaging the rear of said free edge portion when said door panel is closed and being movable downward and out of engagement with said free edge when said door panel is to be opened; and means for biasing said latch plate to move the hooking flange upward toward locking engagement.

2. A sheet-metal wall construction including first and second wall sections having first and second marginal portions, respectively, arranged in juxtaposed relation, one of said wall sections being fixed and the other of said wall sections being movable outward to provide a door; said first marginal portion including a wall member sloping from the outer surface thereof inward and toward said second marginal portion to provide a recess of substantial length opening outward and toward said second marginal portion, and said sloping wall member terminating inward in a free edge portion extending in the same direction as said recess; said second marginal portion also having a recess of substantial length and opening outward and toward said first marginal portion and being located opposite the first-named recess; a latch plate secured to said second marginal portion and extending lengthwise of the recess in said second marginal portion and pivoted to move about an axis extending in the same general direction as said free edge portion, and said latch plate including a hooking flange also extending lengthwise in the general direction of said free edge portion and fitting behind and engaging the back of said free edge portion to hold the wall section functioning as a door in closed position and said hooking flange being movable about said pivot to clear said free edge to permit opening of said door.

3. A sheet-metal wall construction including first and second wall sections having first and second marginal portions, respectively, arranged in juxtaposed relation, one of said wall sections being fixed and the other of said wall sections being movable outward to provide a door; said first marginal portion including a wall member sloping inward from the outer surface thereof and toward said second wall section to provide a recess of substantial length opening outward and toward said second marginal portion, and said sloping wall member terminating inward in a free edge portion extending in the same direction as said recess; said second marginal portion also having a recess of substantial length and opening outward and toward said first marginal portion and being located opposite the first-named re-

cess; a latch member extending lengthwise of the recess in said second marginal portion and including a first side plate member lying substantially flush with the outer surfaces of said wall, a second side plate member extending inward from said first flange and toward said free edge portion, and a hooking flange extending from the inner portions of said second plate member behind said free edge portion and engaging the latter to hold the wall section functioning as a door in closed position; and means pivotally supporting said latch member for movement about an axis extending in the same general direction as said free edge whereby said hooking flange may be moved from behind said free edge to clear the latter and permit the movable wall section to be moved outward.

4. A sheet-metal wall construction including first and second wall sections having first and second marginal portions, respectively, arranged in juxtaposed relation, one of said wall sections being fixed and the other of said wall sections being movable outward to provide a door; said first marginal portion including a wall member sloping from the outer surface thereof inward and toward said second marginal portion to provide a recess of substantial length opening outward and toward said second marginal portion, and said sloping wall member terminating inward in a free edge portion extending in the same direction as said recess; said second marginal portion including a wall member sloping inward and toward said first wall section to provide a second recess located alongside the first-named recess and opening outward and toward said first marginal portion; a latch plate secured to said second marginal portion and extending lengthwise of said second recess and pivoted to move about an axis extending in the same general direction as said free edge portion and including a hooking flange also extending lengthwise in the general direction of said free edge portion and fitting behind and engaging the back of said free edge portion to hold the wall section functioning as a door in closed position, said hooking flange being movable about said pivot to clear said free edge to permit opening of said door.

5. A sheet-metal wall construction including first and second wall sections having first and second marginal portions, respectively, arranged in juxtaposed relation, one of said wall sections being fixed and the other of said wall sections being movable outward to provide a door; said first marginal portion including a wall member sloping inward from the outer surface thereof and toward said second wall section to provide a recess of substantial length opening outward and toward said second marginal portion, and said sloping wall member terminating inward in a free edge portion extending in the same direction as said recess; said second marginal portion including a wall member sloping inward and toward said first wall section to provide a second recess located alongside the first-named recess and opening outward and toward said first marginal portion; a latch member extending lengthwise of said second recess and including a first side plate lying substantially flush with the general plane of said wall, a second side plate extending inward from the longitudinal edge of said first plate which is closest to said first wall section, a hooking flange extending from the inner portions of said second side plate behind said free edge portion and engaging the latter to hold the wall section functioning as a door in closed position,

and a third side plate extending from the longitudinal edge of said first plate remote from the first wall section inward such a distance as to engage the sloping wall member of said second marginal portion; means pivotally connecting said second side plate to said second marginal portion whereby the latch member may be moved about an axis extending lengthwise of the second recess to effect locking engagement and disengagement of said hooking flange and said free edge portion; and means biasing the hooking flange toward locking engagement and the third plate into its engagement with the sloping wall member.

6. An upright sheet-metal wall divided along a transverse line into a fixed upper wall section having a bottom marginal portion extending along the division line and into a lower outwardly movable wall section having a top marginal portion also extending along said division line; said bottom marginal portion including a wall member sloping inward and downward from the outer surface thereof to provide a first recess extending along said division line and opening outward and downward, and said sloping wall member terminating in an inner free edge portion extending in the same general direction as the division line; said top marginal portion of said movable wall section including a wall sloping upward and inward from the outer surface thereof to provide a second recess located alongside said first recess and opening upward and outward; a latch plate extending lengthwise of said second recess and pivotally secured to said top marginal portion to move about an axis extending in the same general direction as said free edge portion and including an inwardly disposed hooking flange projecting upwardly and behind said free edge portion and engaging the rear thereof to hold the movable wall section closed, and said hooking flange being movable about its pivotal axis downward to clear said free edge portion when it is desired to open said movable wall section.

7. An upright sheet-metal wall divided along a transverse line into a fixed upper wall section having a bottom marginal portion extending along the division line and into a lower outwardly movable wall section having a top marginal portion also extending along said division line; said bottom marginal portion including a wall member sloping inward and downward from the outer surface thereof to provide a first recess extending along said division line and opening outward and downward, and said sloping wall member terminating in an inner free edge portion extending in the same general direction as the division line; said top marginal portion of said movable wall section including a wall sloping upward and inward from the outer surface thereof to provide a second recess located alongside said first recess and opening

upward and outward; a latch member extending lengthwise of said second recess and including a first plate member lying substantially flush with the outer surface of said wall, a second plate member extending inward from said first plate member and toward said inner free edge portion, and a hooking flange extending upward from the inner portions of said second plate member and normally positioned behind said free edge and in engagement therewith; and means pivotally supporting said latch member for movement about an axis extending in the same general direction as said free edge whereby said hooking flange may be moved downward to clear said free edge and the movable wall section then moved outward.

8. A wall structure for an enclosure, comprising upper and lower panel members arranged in substantially the same plane and having transverse horizontal edges in meeting relation; at least one of said panel members being removable for access to said enclosure; the lower panel member having an outwardly opening recess extending along its said transverse edge, and formed by a wall extending inwardly and upwardly from the plane of said member; a pair of vertical plates on the rear of said lower member and positioned to form the end walls of said recess; a latch member in said recess and extending lengthwise thereof and having a pair of pivot pins extending from the ends thereof, respectively, and beyond the ends of said recess and behind said lower panel member; one of said vertical plates having a bearing opening to receive one of said pins and the other vertical plate being formed to provide a rearwardly opening slot to receive the other of said pivot pins; a keeper plate detachably secured to said other vertical plate and cooperating with said other vertical plate to close said slot, and providing a bearing receiving said other pivot pin; and a catch plate fixed to said upper panel and adapted to be engaged by said latch member.

9. A sheet-metal wall panel having a marginal portion cut away to provide a recess extending therealong for a substantial distance and comprising a pair of outwardly-extending flange members positioned, respectively, at opposite ends of said recess and fixed to said wall member; a rotatable latch member extending lengthwise of said recess between said flange members and having a pair of pivot pins extending, respectively, from the opposite ends thereof; one of said flange members having a bearing opening therein receiving one of said pivot pins; the other of said flange members being cut away to permit the other pivot pin to be inserted from a side edge thereof; and a keeper plate detachably secured to said other flange member and having a bearing opening receiving said other pin.

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