

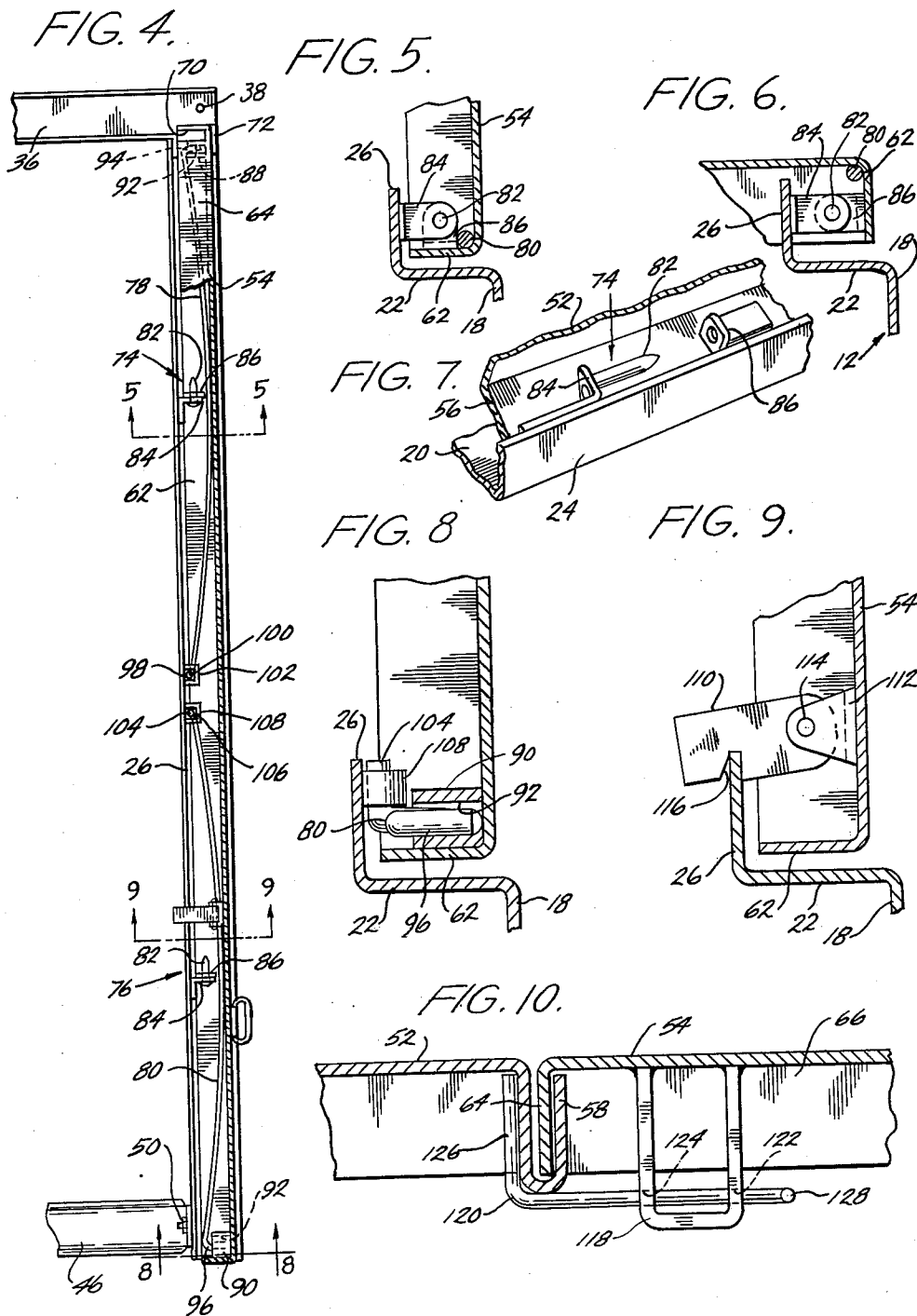
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1

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CELLAR DOOR

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This invention relates to a metallic cellar door construction and has as its general object the provision of a cellar door construction wherein hinge and spring elements for biasing doors toward open positions are so constructed and arranged as to provide a wholly unobstructed door opening.

Another and more specific object of the invention resides in the provision of an improved top frame member or head plate construction which features a simple, easily assembled, waterproof joint between said member or plate and opposing side frame members of the door construction.

The drawings show a preferred embodiment of the invention and such embodiment will be described, but it will be understood that various changes may be made from the construction disclosed, and that the drawings and description are not to be construed as defining or limiting the scope of the invention, the claims forming a part of this specification being relied upon for that purpose.

Of the drawings:

FIG. 1 is a perspective view of a metallic cellar door construction embodying the present invention.

FIG. 2 is an enlarged fragmentary perspective showing a portion of one side frame member and a portion of a top frame member or head plate.

FIG. 3 is an enlarged fragmentary perspective showing a portion of a sill plate, a portion of one side frame member, and a portion of one door.

FIG. 4 is a fragmentary longitudinal section taken generally as indicated at 4-4 in FIG. 1.

FIG. 5 is a fragmentary transverse section with background parts omitted taken generally as indicated by the line 5-5 in FIG. 4.

FIG. 6 is a section similar to FIG. 5 but with the door in a closed position.

FIG. 7 is a fragmentary perspective of a portion of one side frame member and one door showing a connecting hinge.

FIG. 8 is a fragmentary transverse section taken generally as indicated by the line 8-8 in FIG. 4 with background parts omitted.

FIG. 9 is a fragmentary transverse section taken generally as indicated by the line 9-9 in FIG. 4 with background parts omitted.

FIG. 10 is a fragmentary transverse section taken generally as indicated by the line 10-10 in FIG. 1 with background parts omitted.

In accordance with the present invention, the cellar door construction comprises similar left and right-hand sheet metal side frame members and a sheet metal top frame member or head plate. In the drawings, left and right-hand side frame members are indicated respectively at 10 and 12 and a top frame member or head plate is indicated generally at 14. The side frame members 10 and 12 shown have similar substantially vertical side walls 16 and 18 and similar inwardly projecting narrow longitudinally extending top walls 20 and 22. The left-hand top wall 20 carries an integrally formed and longitudinally extending upright flange 24 at its inner edge and the right-hand top wall 22 has an integrally formed longitudinally extending upright flange 26 along its inner edge. As shown, each of the side walls 16 and 18 is

2

triangular in shape and its corresponding top wall is inclined downwardly from the horizontal. However, side frame members with side walls of various shapes, and even frame members without side walls, may be provided within the scope of the invention.

The side frame members 10 and 12 shown are adapted to be used with a foundation and stair well of concrete or the like which has a generally horizontal upper surface such as the foundation 28 shown. Rear edges of the side walls 16 and 18 of the side frame members abut the side wall 30 of a residential or other structure and they are preferably provided with inwardly projecting flanges 32, 32, one shown. The lower edges of the side walls 16 and 18 rest on the side portions of the foundation 28 and said lower edges are also preferably provided with inwardly projecting flanges 34, 34, one shown.

The top frame member or head plate 14 extends transversely between upper end portions of the top walls 20 and 22 of the side frame members 10 and 12. As best shown in FIG. 2, said frame member or head plate has a body portion 36 which can be attached flatly to the top walls 20 and 22 at opposite ends by means of suitable bolts 38, 38, two shown. At a rear edge portion of the body 36, an upright transversely extending flange 40 is provided and said flange is preferably angularly related with the body portion 36 so as to align flatly with the rear edge surfaces of the side walls 16 and 18 of the left and right-hand frame members 10 and 12. Said flange 40 can thus be flatly engaged with a side wall 30 of a residential or other structure as illustrated in FIG. 1.

There is also formed on the body portion 36 of the top frame member or head plate 14 and, along the front or lower edge thereof, a second upright transversely extending flange 42. The flange 42 extends between and over the upper end portions of the flanges 24 and 26 on the side frame members 10 and 12. Moreover, and as best shown in FIG. 2, the flange 42 is bent at right angles at opposite end portions 44, 44, one shown, so as to extend downwardly along the outer surface of said flanges 24 and 26. Thus, it will be seen that the joint between the side flanges 24 and 26 and the flange 42 is substantially waterproof. Rain water or water derived from melting snow cannot pass inwardly through said joint to the door opening, but will instead be directed downwardly along the top walls 20 and 22 outwardly of the flanges 24 and 26.

The metallic door construction preferably also includes a sill plate 46 which is formed of sheet metal and which is preferably of a channel cross section. The sill plate 46 has upstanding flanges 48, 48, one shown, at opposite ends and is preferably connected with lower end portions of the flanges 24 and 26 by means of bolts 50, 50 passing through suitable openings in the flanges 48, 48 and the flanges 24 and 26. Preferably a single bolt is used to connect the sill plate to the side frame members 10 and 12 at each end of the sill plate. This provides for easy pivotal adjustment of the sill plate as may be required by uneven or inclined foundations.

From the foregoing it will be readily apparent that a frame assembly comprising the side frame members 10 and 12, the top frame member or head plate 14, and the sill plate 46 can be readily secured in position as shown in FIG. 1. One or more doors may thereafter be readily mounted over the generally rectangular door opening which is thus provided in a downwardly inclined attitude. As shown, left and right-hand doors 52 and 54 are provided and said doors are of similar sheet metal construction in generally rectangular form.

In further accord with the present invention, each of the doors 52 and 54 is provided with a depending mar-

ginal flange along at least one side edge portion thereof. As shown, each of the doors 52 and 54 is provided with a depending marginal flange along each of its four side edge portions. The left-hand door 52 has an outer flange 56, an inner flange 58, a top flange, not shown, and a bottom flange 60. The right-hand door 54 has an outer flange 62, an inner flange 64, a top flange 66, and a bottom flange 68. Still further in accord with the invention, each of the doors 52 and 54 is constructed so that its outer flange is spaced transversely outwardly from but disposed in parallel relationship with the corresponding flange on a side frame member when the door is in a closed position. More specifically, the outer flange 56 of the door 52 is disposed in parallel relationship with the flange 24 on the side frame member 10 but is spaced outwardly therefrom when the door 52 is in a closed position. The outer flange 62 on the door 54 is disposed in parallel relationship with the flange 26, but is spaced outwardly therefrom when the said door is in a closed position. This relationship of the door and frame flanges is well illustrated in FIG. 6 wherein the flange 62 is shown in transversely spaced relationship with the flange 26 on the side frame member 12.

As best shown in FIG. 4, the outer flange 64 on the door 54 has a narrow downwardly open slot 70 at an upper end portion to receive the flange 42 on the top frame member 14 when the door is in a closed position. The left-hand door 52 has a similar slot (not shown) formed in its inner flange 58 and which serves a similar function. Further, the inner flange 58 of the left-hand door 52 is generally U-shaped as best illustrated in FIG. 10 and said flange receives the inner flange 62 on the right-hand door 54 when the doors are in closed positions. A small rain shield or tab 72 at the upper inner corner of the right-hand door 54 prevents leakage through the slots 70, 70 in the inner flanges of the left and right-hand doors. Rain water or water derived from melting snow thus flows downwardly within the U-shaped flange 58 and is discharged harmlessly at the lower end of said flange without entering the door opening.

Still further in accord with the present invention, each of the doors 52 and 54 is provided with a hinge and spring assembly which provides for free swinging movement of the doors relative to the frame and a biasing action toward the open positions of the doors and which entails no obstruction of the door opening whatsoever. As mentioned above, the outer door flanges 56 and 62 are spaced outwardly from the frame flanges 24 and 26. The said hinge and spring assemblies are disposed wholly within the spaces between said flanges and have no projecting parts which extend inwardly of the flanges 24 and 26 into the door opening. Thus, a person such as an occupant of a residence equipped with the cellar door construction will not encounter the inconvenience or annoyance of inadvertently bumping against or catching clothes on springs, hinges, or other projections in passing through the door opening.

Preferably the hinge and spring assemblies for each of the doors 52 and 54 are identical and it is therefore necessary only to fully show and describe one of said assemblies. In FIG. 4 the complete hinge and spring assembly for the right-hand door 54 is illustrated with the door in an open position. The assembly comprises an upper hinge indicated generally at 74, a similar lower hinge indicated generally at 76, and at least one elongated torsion spring. Preferably and as shown, upper and lower torsion springs 78 and 80 are provided for each door.

Each of the hinges 74 and 76 comprises a pin element which includes a pin 82 and an integrally formed transversely extending support portion or member 84. The pins project generally longitudinally and have their upper ends exposed and the support members or portions of the pin elements are fixedly secured to the flange 26.

Each of the hinges 74 and 76 also includes an aper-

tured pin receiving element 86. The pin receiving elements 86 loosely receive the pins 82, 82 so as to be rotatable thereabout and said elements are fixedly mounted on the outer flanges of their respective doors. The manner in which the receiving elements 86, 86 are mounted on the flange 62 of the right-hand door 54 is illustrated in FIGS. 4, 5 and 6.

In FIG. 7 the upper hinge 74 on the left-hand door 52 is shown with its parts disengaged. Referring particularly to FIG. 7, it will be apparent that the doors 52 and 54 can be conveniently assembled with the assembled door frame by moving the doors longitudinally downwardly to engage the receiving elements 86 with the pins 82 of the upper and lower hinges 74 and 76. When the hinge elements are so engaged, the support elements 84 secure the doors against longitudinal downward movement in the direction of inclination of the top walls 20 and 22 of the frame side members, but the doors are free to move upwardly so as to disengage the hinge elements.

The torsion springs 78 and 80 mentioned above bias the left and right-hand doors 52 and 54 toward their open positions and they also serve to secure said doors longitudinally with respect to the assembled frame comprising the side frame members 10 and 12, etc. As best shown in FIG. 4, the door 54 is provided with upper and lower brackets 88 and 90. Said brackets have transversely extending openings 92, 92 which respectively receive and hold transverse projections 94 and 96 formed respectively at the upper end of the upper torsion spring 78 and at the lower end of the lower torsion spring 80. At its lower end, the upper torsion spring 78 is provided with a transverse projection 98 which is entered in and held within a transverse opening 100 in an upper bracket 102 secured at a central portion of the flange 26. A transverse projection 104 at the upper end of the lower torsion spring 80 is entered in and held within an opening 106 in a lower bracket 108 secured on a central portion of the flange 26.

As best shown in FIG. 8, the projections at opposite ends of the torsion springs extend at right angles with respect to each other. The springs are in a relaxed or slightly twisted condition when the doors are in the open positions. When the doors are moved to their closed positions, their associated torsion springs are substantially twisted and when the doors are subsequently opened, the said springs assist the operator in lifting the doors.

The manner in which the torsion springs secure the doors against relative longitudinal movement will be apparent from the foregoing. The transverse end portions or projections on the springs are entered within their respective transverse bracket openings to prevent such door movement. Moreover, it is preferred that the upper and lower springs 78 and 80 be slightly bowed as shown. When the springs are so bowed, the upper springs urge the doors upwardly and the lower springs urge the doors downwardly with substantially equal force to prevent even nominal relative longitudinal door movement.

A means for securing the doors in the open position is preferably also provided. As best shown in FIG. 9, the right-hand door 54 is provided with a gravity engaged latch 110 which is hingedly connected to the door by means of a bracket 112 and a pivot pin 114. The latch 110 has a notch 116 which receives the flange 26 when the door is in the open position to hold the door in such position. When it is desired to close the door, the latch may be lifted as by means of foot pressure permitting the door to freely close. The left-hand door 52 is provided with a similar latch 110 adapted to fulfill a similar function.

In FIG. 10 there is shown a latching device for locking the doors 52 and 54 in their closed positions. Said device comprises a bracket 118 mounted adjacent the inner edge of the right-hand door 54 and a bolt 120. The bolt 120 is slidable in apertures 122 and 124 in the bracket 118 and has right angularly arranged projections 126 and 128

5

at opposite end portions. The projection 126 engages the inner surface of the door 52 when the bolt is in a locking position as shown in FIG. 10. When it is desired to open the doors, the projection 128 may be utilized as a handle to turn the bolt about its centerline and to move the bolt rightwardly to withdraw the projection 126 from beneath the door 52.

The invention claimed is:

1. In a metallic cellar door construction, the combination of similar left and right-hand sheet metal side frame members each comprising a narrow longitudinally extending top wall inclined from the horizontal and provided with an upright longitudinal flange, a transverse sheet metal top frame member connected between said left and right-hand frame members at upper end portions of their top walls, a generally rectangular left-hand sheet metal door provided with a depending marginal flange which is disposed outwardly of and which extends longitudinally in spaced parallel relationship with said upright flange on said left-hand side frame member when the door is in a closed position, a generally rectangular right-hand sheet metal door provided with a depending marginal flange which is disposed outwardly of and which extends longitudinally in spaced parallel relationship with said upright flange on said right-hand side frame member when the door is in a closed position, and similar left and right-hand hinge and spring assemblies respectively swingably connecting said left and right-hand doors with said left and right-hand side frame members and biasing said doors toward open positions, said left and right-hand hinge and spring assemblies being wholly disposed respectively within the spaces between said upright longitudinal flanges on said side frame members and the associated depending door flanges and each comprising upper and lower hinges and at least one elongated torsion spring which is connected at opposite ends to the adjacent door and side frame member.

2. The combination in a cellar door construction as set forth in claim 1 wherein each of said hinges comprises a pin element and an apertured pin receiving element, one of said elements being fixedly mounted on the adjacent door and the other of said elements being fixedly mounted on the adjacent side frame member, and the said elements of each hinge being engageable by downwardly inclined longitudinal movement of the door relative to the frame and being operative thereafter to secure the door against such movement, and wherein each of

6

said torsion springs secures its associated door against upwardly inclined longitudinal movement.

3. The combination in a cellar door construction as set forth in claim 2 wherein each pin element comprises a transverse supporting portion connected with the adjacent upright longitudinal flange and a pin portion which is held by the supporting portion so as to project longitudinally upwardly therefrom in transversely spaced relationship with said adjacent upright flange, and wherein each apertured element is mounted on the door adjacent thereto and adapted to be engaged with its corresponding pin element by relative downwardly inclined longitudinal movement of the door, said supporting portions of said pin elements serving on engagement with said apertured elements to secure the doors against such movement.

4. The combination in a cellar door construction as set forth in claim 3 wherein upper and lower elongated torsion springs are provided for each door, and wherein each of said springs is connected at opposite ends to the adjacent door and side frame member so as to bias the door toward its open position and to secure the same against downwardly inclined longitudinal movement relative to the said side frame member.

5. The combination in a cellar door construction as set forth in claim 4 wherein each torsion spring has transverse projections at upper and lower ends, wherein each door is provided with longitudinally spaced upper and lower brackets with transverse openings respectively for receiving and holding the transverse projections at the upper end of the upper torsion spring and at the lower end of the lower torsion spring, and wherein each upright longitudinal flange is provided exteriorly at a central portion with longitudinally adjacent upper and lower brackets having transverse openings respectively for receiving and holding the transverse projections at the lower end of the upper torsion spring and at the upper end of the lower torsion spring.

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