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FOLDABLE WALL ASSEMBLY

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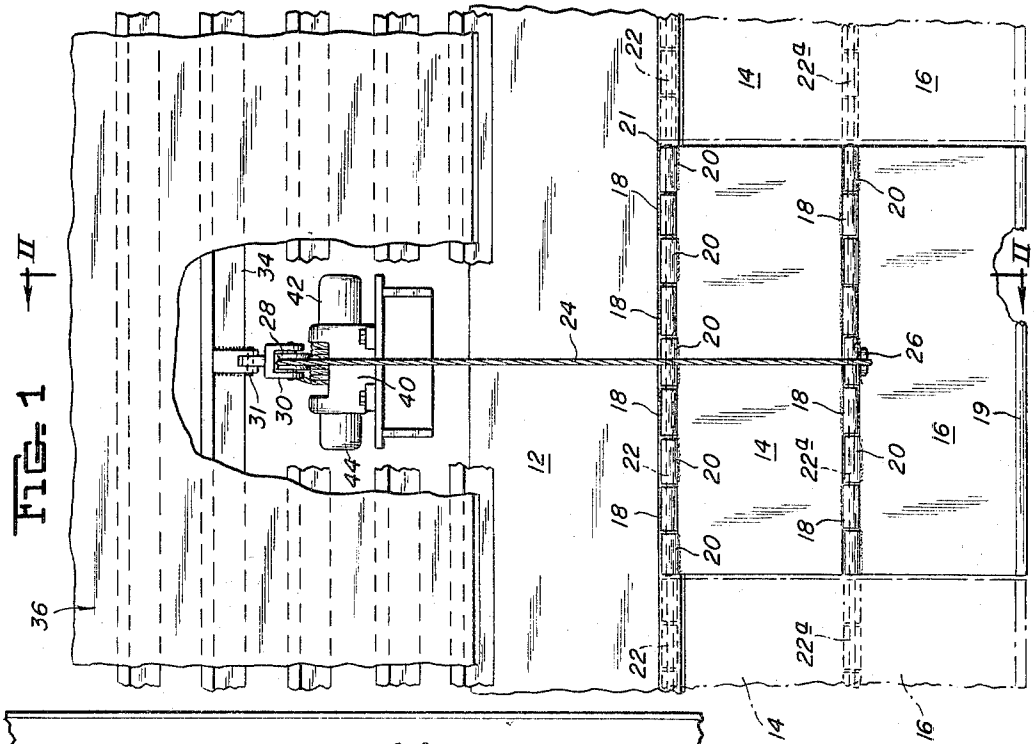

FIG. 1

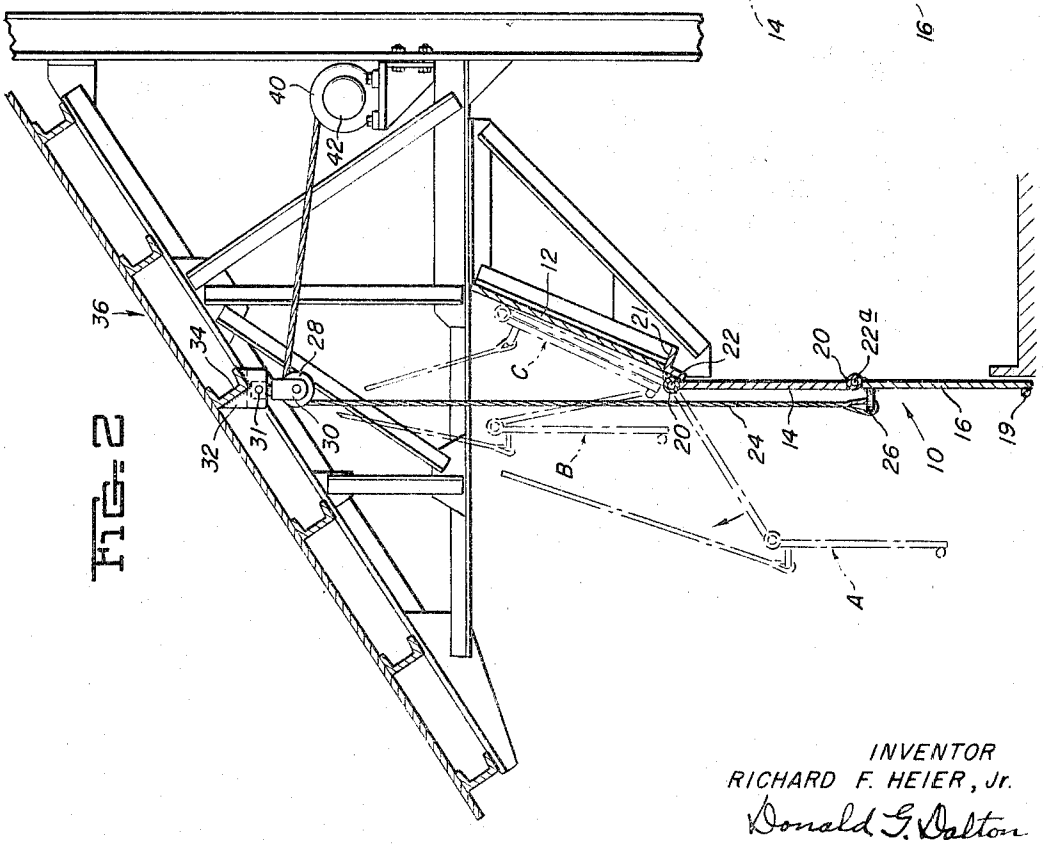

FIG. 2

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FOLDABLE WALL ASSEMBLY

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The present invention relates to a foldable wall assembly. More particularly, the invention is directed to a foldable wall assembly which is readily collapsible for storage and which is particularly useful where intermittent closure is desired.

Among the industrial applications for my foldable wall assembly, include furnace buildings and other structures where great amounts of heat tend to accumulate and adversely affect working conditions of the personnel. In industrial sites where such conditions occur, it is frequently desirable to maintain at least one side of the building open to the atmosphere, i.e. without at least one side wall, in order to provide adequate ventilation during warm months of the year. In the colder weather, it is desirable to enclose the opened side of the building with a temporary wall. Instead of building temporary walls which must be dismantled, this invention provides a foldable wall assembly which is self-storing when folded into a final resting position. The wall can be easily unfolded for use with a minimum of effort and inconvenience, and the ease with which it may be raised or lowered makes it suitable for use as a door.

A representative embodiment of the invention is shown in the accompanying drawings wherein:

FIGURE 1 is a front elevational view of the foldable wall assembly, and

FIGURE 2 is a side elevation of the wall assembly shown in FIGURE 1 taken along line 2—2 in FIGURE 1.

As shown in FIGURES 1 and 2, the foldable wall assembly **10** includes a fixed upper panel **12** and a plurality of movable or foldable lower panels. In the extended position, the foldable panels depend seriatim from panel **12** and the panels are hingedly connected, i.e. pivotally attached, at their upper edge to the next succeeding upper adjacent panel. Fixed panel **12** is inclined to facilitate storing the movable panels of the wall structure as described below. Middle panel **14** is hinged to fixed inclined panel **12** and lower panel **16** at the adjacent edges thereof. In the preferred embodiment, the panels are hinged with a plurality of pipe sleeves **18** and **20** which are attached to the bottom edge of panels **12** and **14** and to the upper edge of panels **14** and **16** respectively. In the assembly, each of pipe sleeves **18** fits cooperatively between correspondingly spaced apart pipe sleeves **20** and hinge pins **22** and **22***a* are inserted longitudinally through the pipe sleeves providing a hinge attachment between panels **14** and **16** which allows the panels to rotate. If desired, the pipe sleeves can be attached to the panels with an intermediate flanged member **21** which is shown at the attachment of panels **12** and **14**. A pipe or bar **19** may be attached to the bottom of panel **16** to provide greater rigidity thereto.

As best seen in FIGURE 2, flexible lifting means, such as a lifting cable **24** with one end attached to a U-bolt **26** welded to panel **16** extends upwardly and over a rotatable cable support such as sheave wheel **28**; the sheave wheel is mounted in a housing **30** attached to overhead superstructure **36** of the building. The flexible lifting means may be a strap, chain, cable, rope or the like. It is important that the cable be attached to the lower panel **16** in such a way that the upward pull by the cable will cause the panel to be raised and enable all movable panels to pivot about the hinge at the lower end of fixed inclined panel **12**. This is accomplished in the embodiment illustrated by attaching cable **24** to a U-bolt which is slightly displaced from the panel **16**. After passing over the sheave, the cable is attached to a brake-equipped motor-operated winch which may be disposed in any suitable location. The sheave housing **30** hangs freely from pin **31** in bracket **32** which is welded or otherwise fixedly attached to a roof purlin **34** of the superstructure **36**.

To retract or fold the wall assembly **10** from its lowered, i.e. extended, position shown in FIGURE 1, it is only necessary to pull cable **24** by winding with a winch **40** driven by reversible motor **42** which causes a lifting strain to develop in the cable and in turn exerts a pull on wall **10**. The upward traveling cable **24** causes panel **14** to rotate about hinge pins **22** located at the bottom of panel **12** and gravity causes panel **16** to rotate about hinge pins **22***a* at the bottom of panel **14** thereby causing panels **14** and **16** to rotate upwardly through the phantom (dotted outline) positions A, B and C. The winch motor is shut off as the two panels reach an upright vertical position between B and C, thereby releasing the tension on cable **24** and allowing the momentum of the two panels, caused by the centrifugal rotation thereof, to carry the two panels beyond the vertical position to final resting position C where the panels are folded with adjacent and alternate edges abutting. In the resting position, the panels can be wired or otherwise secured and stored for as long as desired. It is noted that the position of the sheave above the foldable wall structure is important in retracting the wall to enable the momentum of the movable panels to bring them into a final resting position. If the sheave is positioned too far off the center line of the depending panels in the unfolded wall, the movable panels can not be brought into a final position of rest by the centrifugal rotation alone. For this purpose, the sheave should be positioned no further from the center line than the height of the movable panels. For best results, the sheave should be attached to the superstructure at a position only slightly displaced from the center line of the extended depending panels.

The foldable wall panels are withdrawn from fixed upper panel **12** and safely lowered into position (after unsecuring the stored panels) by starting the winch motor causing cable **24** to pull panels **14** and **16** away from fixed panel **12** and to rotate toward position B shown in FIGURE 2. As the two panels reach the vertical position, the motor is again shut off allowing the panels to swing past the center line by their own momentum after which the motor brake **44** can be used to controllably lower the panels safely through positions B and A into the final lowered position shown in FIGURE 1.

Among the advantages of the foldable wall structure described above, is that it may be set up or retracted in a very short time with a minimum of effort. It is considerably less expensive to use than the temporary wall structures which must be constructed and dismantled. Another distinct advantage of the invention is its built-in self-storing feature which permits it to be stored at the building site yet is in a position to be erected quickly.

The folding wall structure while preferably made of steel can also be made of other suitable structural materials or combinations of materials. The wall and the components can be made in various sizes to suit the needs of the particular application. Other movable panel-supporting structures can be used in lieu of fixed upper panel **12** to support the movable panels both in the unfolded and storage positions. Two or more foldable wall assemblies can be used to accommodate a large opening, and the same fixed upper panel or panel-supporting structure can be used for all of the wall assemblies.

I claim:

1. A foldable wall assembly comprising a fixed, wall panel-supporting structure, a plurality of foldable wall panels adapted to depend seriatim from the lower edge

of said fixed panel-supporting structure, said fixed wall panel-supporting structure being inclined upwardly and rearwardly at an acute angle to a vertical plane through the foldable wall panels when in the unfolded position, said foldable wall panels being pivotally attached at their upper edge to the next succeeding upper adjacent panel and the uppermost of said panels being pivotally attached at its upper edge to the panel-supporting structure, means for raising said pivotally attached foldable panels so that said panels fold in face to face relationship and come to a position of rest on said inclined fixed panel-supporting structure by a force caused by centrifugal rotation of said panels about the lower edge of said panel-supportting structure and means to withdraw and to controllably lower said pivotally attached foldable panels.

2. A foldable wall assembly for use in buildings having an overhead superstructure comprising a fixed upper wall panel, two movable wall panels adapted to depend seriatim from said fixed upper panel, said movable panels being hingedly connected together and the uppermost of said movable panels being hingedly connected at its upper edge to the lower edge of said fixed upper panel, said fixed upper panel being inclined upwardly and rearwardly at an acute angle to a vertical plane through the movable wall panels when in the unfolded position, flexible lifting means for lifting said movable panels, attachment means for securing said flexible lifting means to the lowermost movable panel, said attachment means being slightly displaced from the center line of said unfolded movable wall panels, a rotatable cable support over which said flexible lifting means passes secured to said overhead superstructure, means for pulling said flexible lifting means to raise said movable panels from their extended unfolded position and cause said panels to fold and come to rest on said inclined upper panel by a force caused by centrifugal rotation of said panels about the lower edge of said upper inclined panel and means to controllably lower said flexible lifting means to cause said movable panels to unfold.

3. A foldable wall assembly according to claim 2 wherein said means for pulling and controllably lowering said flexible lifting means comprise a reversible motor and winch and a brake.

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