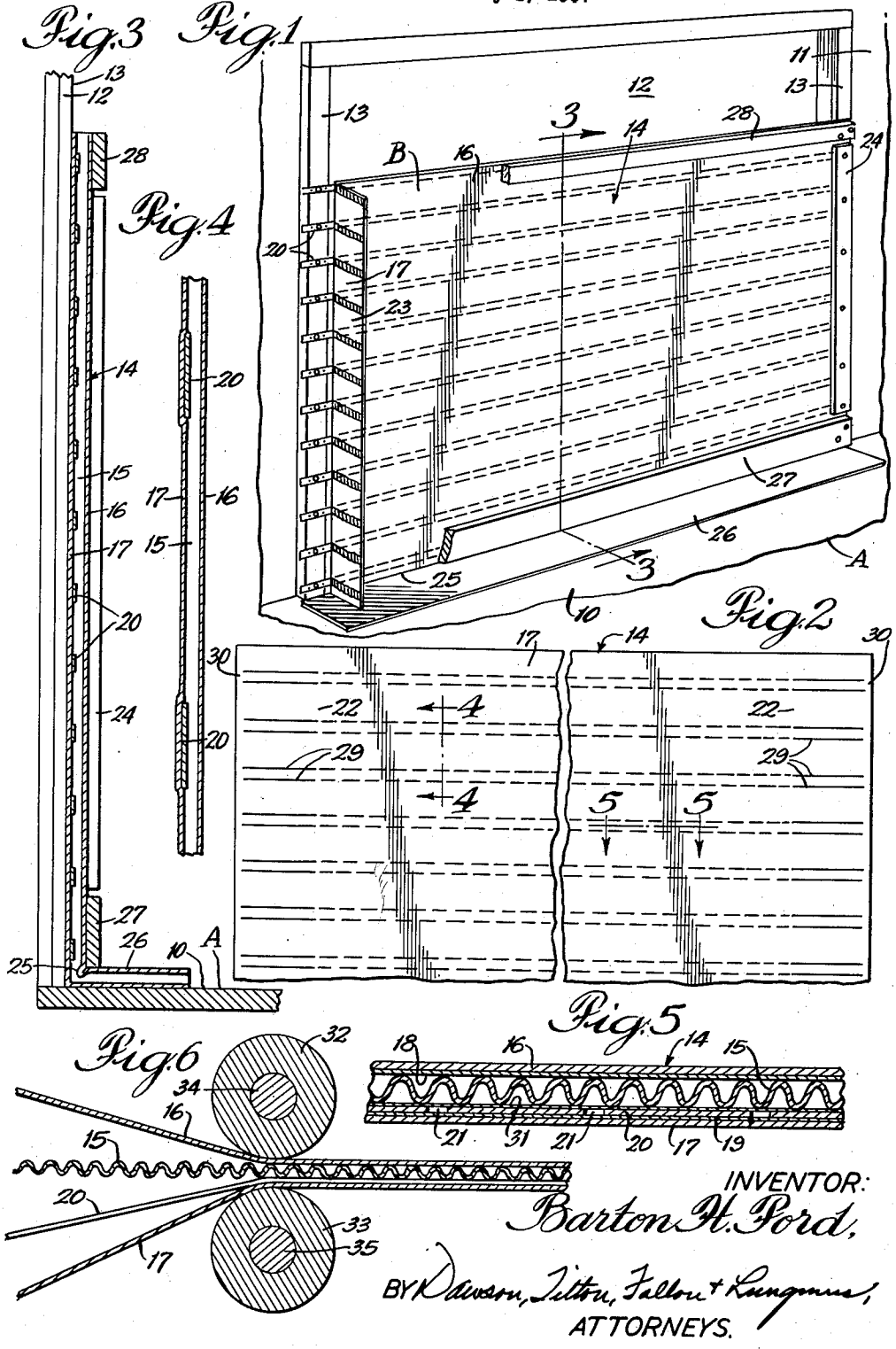
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METHOD OF FORMING A GRAIN DOOR

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METHOD OF FORMING A GRAIN DOOR

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4 Claims. (Cl. 154—118)

This invention relates to a method for forming a grain door, and, more particularly, a closure for a railway car doorway or car barricade.

The present application is a continuation-in-part of my copending application, Serial No. 568,482, filed February 29, 1956.

An object of the present invention is to provide a method for forming a grain door in an expeditious manner so that it may be set up and employed with a minimum of labor and effort. A further object is to provide a method for fabricating a grain door which lends itself to machine operations so that the door can be completely fabricated at low expense while at the same time providing a door which may be installed with important new advantages and which has the further advantage of exposing automatically the reinforcing steel straps for nailing the same to the door frame. A still further object is to provide a grain door which may be fabricated in one or more panels and folded into a compact form for shipment, while at the same time permitting ready application to a door frame. Other specific objects and advantages will appear as the specification proceeds.

The invention is shown, in illustrative embodiments, by the accompanying drawing, in which—

Figure 1 is a perspective view of a railway car equipped with a closure embodying my invention; Fig. 2, a broken rear view of the corrugated board employed; Fig. 3, a vertical sectional view, the section being taken as indicated at line 3—3 of Fig. 1; Fig. 4, an enlarged broken sectional view, the section being taken as indicated at line 4—4 of Fig. 2; Fig. 5, an enlarged sectional detail view, the section being taken as indicated at line 5—5 of Fig. 2; and Fig. 6, a sectional view showing the method of assembly of the parts in accordance with a method embodying my invention.

In the illustration given, A designates a portion of a railway car, and B designates my grain door applied thereto. The car portion A is shown provided with a floor 10 and a side wall 11 provided with an opening 12 surrounded by a door frame 13.

The grain door or closure B comprises a corrugated board 14 having an inner corrugated core 15, the core 15 lying between an inner liner 16 and an outer liner 17. The inner liner 16 is bonded to the core 15 by the glue layer 18, and the outer liner 17 is bonded to the core 15 by the glue layer 19. Metal straps 20 extend in spaced relation between the outer liner 17 and the outer bends of the core 15. The straps 20 are preferably provided with spaced openings 21 through which nails may be driven to secure the ends of the straps to the frame 13.

The corrugations or flutes 15 preferably extend vertically in the board 14, and the straps 20 abut the outer edges of the spaced bends of the core 15, as shown best in Figs. 4 and 6.

The board 14 is provided adjacent its side edges with score lines 22 so as to permit the corrugated board to be turned inwardly to provide side flaps 23. Since the outer liner 17 is formed of paper or other frangible material, the liner tears away from the metal straps 20 to leave them lying flat against the frame 13 so that they may be readily nailed in position while the flap is drawn rearwardly, as illustrated in Fig. 1. After the nailing operation, the flap 23 may be moved backwardly in place and a batten 24 or other suitable means employed for securing the flap in a position over the nailed strap ends 20. The corrugated board is preferably also scored along line 25 near its bottom to provide a bottom flap 26. A pry-board 27 may be nailed above the flap 26 and a headboard 28 may be secured over the top portion of the door.

In the foregoing installation operation, it will be observed that an important feature is the ready separation of the flap 23 from the metal straps 20. While the door is being shipped to its destination or is being handled preparatory to installation, it is desired that the sharp metal ends of straps 20 be securely sheathed within the door by the paper liners, but when the door is to be installed, it is desired that the straps be readily exposed for nailing when the flaps 23 are bent inwardly. This is accomplished by forming the outer liner 17 of paper or other frangible material, and I prefer also to provide the outer liner with spaced slits 29 about each of the straps so that the liner tears along true and cleancut lines. It is preferred that the slits 29 terminate at a spaced distance from the edge of the liner sheet, as indicated at 30, so that a tongue segment of the paper confines these slitted portions of the liner about the metal straps. Instead of slitting, perforations or other means for providing weakened lines about the straps, may be employed to provide a ready tearing of the liner.

I have discovered that by locating the metal strap 20 directly against one side of the core 15, there is a minimum of contact between the strap 20 and the core, and this aids in the ready separation of the strap from the core even though the core be initially provided with glue for bringing about a ready attachment of the core to the liner strips 16 and 17. If desired, an oil film 31 may be provided over the side of the metal strap 20 adjacent the core 15 to bring about ready separation.

The new door structure may be formed expeditiously and with a minimum of cost with the apparatus illustrated in Fig. 2. Rollers 32 and 33, mounted on driven shafts 34 and 35, respectively, compress between them the core 15, the inner liner 16, and the outer liner 17 to bring the liners into contact with the core 15, the core 15, or the inner edges of the liners 16 and 17, being previously provided with adhesive. Spaced straps 20 are fed simultaneously between the core 15 and the outer liner 17 so as to form in one operation a complete door strip which is advanced continuously. Later, the strip is cut into sections for the individual doors. Slits are formed in the doors, as illustrated in Fig. 2. If desired, the strips 20 may be on the outside of the liner 17 and a second gummed liner (not shown) may be employed for confining the strap 20 against the outer side of liner 17, all as shown in greater detail in my copending application, Serial No. 568,482. I prefer, however, to secure the straps 20 in position directly against the core 15 for the advantage that the straps 20 may later be readily separated from the flaps 23 when the same are folded inwardly.

While, in the foregoing specification, I have set forth a structure and method in considerable detail for the purpose of illustrating the invention, it will be understood that such details of structure and procedure may be varied widely by those skilled in the art without departing from the spirit of my invention.

I claim:

1. In a process for continuously forming a grain door, the steps of passing between forming rollers a corrugated

medium enclosed between frangible liner sheets while simultaneously passing flat metal straps in spaced relation between one of said liner sheets and said corrugated medium and transverse to the flutes of said medium.

2. In a process for continuously forming closure doors, the steps of passing between forming rollers a continuous strip of corrugated medium and frangible paper liners on both sides of said medium and with adhesive between said medium and liners while simultaneously feeding flat metal straps in spaced relation between one of said liners and said corrugated medium and the spaced relation against said corrugated medium and transverse to the flutes thereof to bond said one liner to said straps and said corrugated medium, and severing the resulting board into door panels.

3. In a process for continuously forming grain doors, the steps of passing between forming rollers a continuous strip of corrugated paper medium with frangible paper liners on both sides of said medium and with adhesive for bonding said liners to said medium while simultaneously feeding flat steel straps in spaced relation along the face of one side of said corrugated medium transverse to the flutes thereof and bonding one of said liners to said straps and said corrubated medium while bonding

the other liner directly to said corrugated medium, and severing the board into door panels, said board being scored at transverse vertical lines adjacent the edges of the board to provide flaps which may be drawn rearwardly to separate the flaps from said steel straps.

4. In a process for continuously forming a corrugated panel adapted to be installed in a grain car, the steps of passing between forming rollers a corrugated medium enclosed between frangible liner sheets while simultaneously passing flat metal straps in spaced, parallel relation between one of said liner sheets and said medium and transverse to the flutes of said medium, and severing the resulting panel along spaced-apart lines parallel to the flutes of said medium.

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CERTIFICATION OF CORRECTION

Patent No. 2,966,438 December 27, 1960

Barton H. Ford

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 3, line 12, for "the" read -- in --; line 25, for "corrubated" read -- corrugated --.

Signed and sealed this 6th day of June 1961.

(SEAL)
Attest:

ERNEST W. SWIDER
Attesting Officer

DAVID L. LADD
Commissioner of Patents