

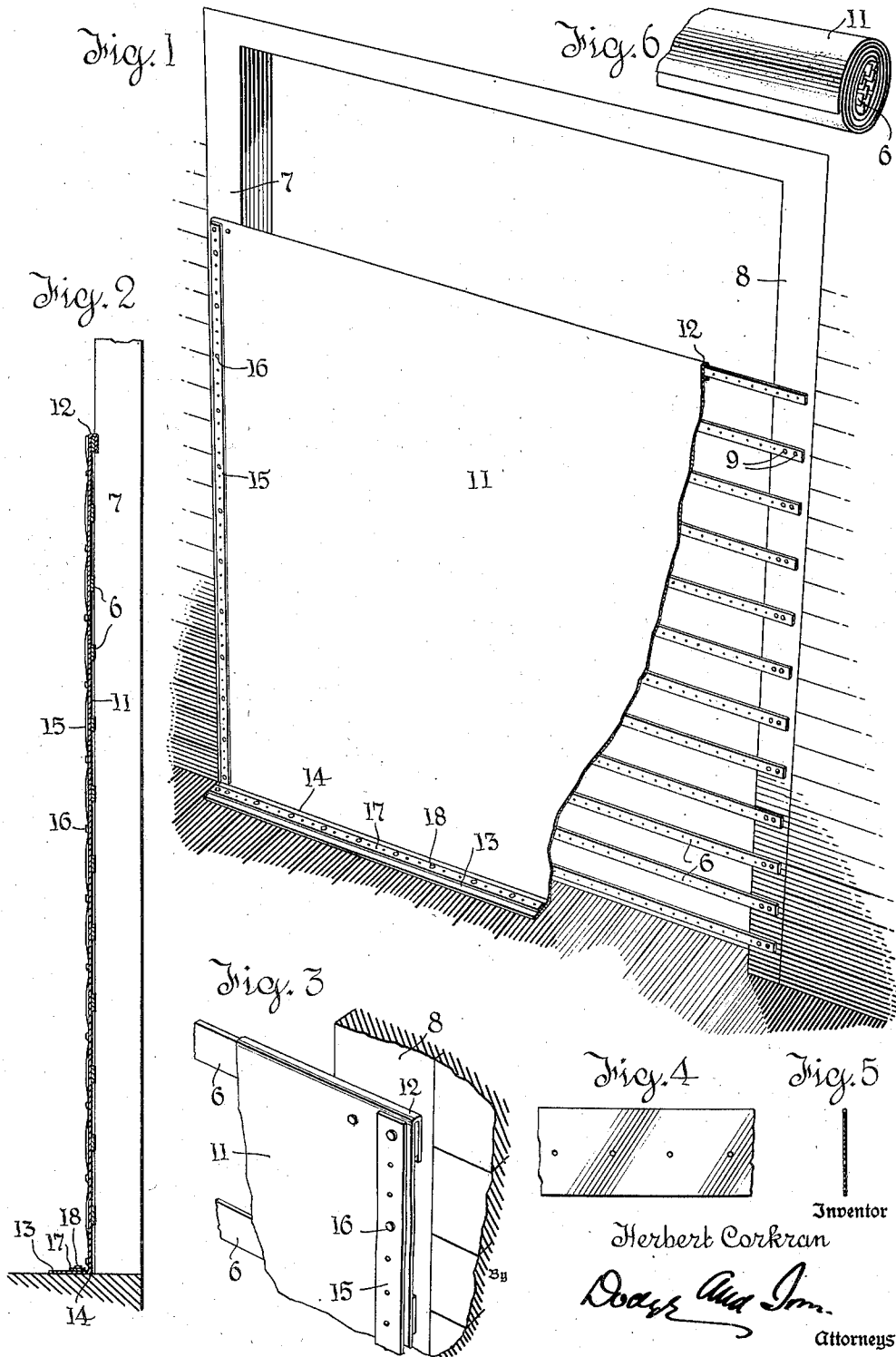
May 3, 1938.

H. CORKRAN

2,116,260

GRAIN DOOR FOR RAILWAY CARS

Filed June 22, 1937



Inventor

Herbert Corkran

Doyle and Son

Attorneys

UNITED STATES PATENT OFFICE

2,116,260

GRAIN DOOR FOR RAILWAY CARS

Herbert Corkran, Baltimore, Md.

Application June 22, 1937, Serial No. 149,784

6 Claims. (Cl. 20—27)

This invention relates to railway cars and like vehicles, and particularly to what are called "grain doors".

When grain is shipped in bulk in box cars, a temporary barrier, called a grain door is built against the inner side of the doorway to a suitable height. These doors, as heretofore constructed have been unduly expensive. They cannot justifiably be destroyed after a single use, while reuse involves property accounting, return to point of reuse and similar complications.

There has long been a demand for a grain door which would meet the demands of the service and yet be so inexpensive as to be "expendible"—that is, intended for a single use after which it is destroyed. Such a door would save initial outlay and expensive accounting and reshipment.

A car has two doorways which must be equipped with grain doors and the cost per car has heretofore been about six dollars. The present invention provides satisfactory grain doors which cost about one dollar per car and cannot be reused. This is the total cost, as there is neither salvage nor reshipment.

Briefly stated the invention contemplates a sustaining structure of thin horizontal steel straps nailed to the sides of the doorway, and hence acting simply in tension across the doorway; and an inner cover of tough paper (waterproof or semi-waterproof) battened to the door post and floor with further steel straps.

The length of the straps and the horizontal dimension of the paper are based on the width of the widest standard door. On narrower doors there is simply a greater overlap. The number of straps and the vertical dimension of the paper are based on the maximum grain door height. Hence equipment for all standard cars regardless of door size can be standardized, and works out conveniently in practice to thirty straps each 84 inches long rolled up in two sheets of heavy paper, each 90 inches square. The components can be suitably packaged for issue as a unit, and such method is preferred.

For a clearer understanding of the invention reference is made to the accompanying drawing, in which:—

Fig. 1 is a perspective view of a car doorway, looking from within the car and showing the invention applied. Parts are broken away to show the construction.

Fig. 2 is a vertical section through the grain door on a slightly larger scale than Fig. 1.

Fig. 3 is a fragmentary perspective view on a

still larger scale showing the upper right hand corner of the grain door as viewed in Fig. 2.

Fig. 4 is a face view and Fig. 5 a cross section of the steel strap, shown full size in the original Patent Office drawing.

Fig. 6 is a fragmentary perspective view of the rolled package as it appears prior to installation of the door.

In Figs. 1, 2 and 3 it has been necessary to exaggerate the thickness of the straps. Actually the straps can be so thin that the paper lies virtually flat in contact with the door posts.

For the maximum height of grain door I prefer to use twelve cross straps, and while the precise number is not controlling the description will be on that basis.

The first operation is to nail across the doorway eleven horizontal straps 6. These are drawn taut and are approximately evenly spaced vertically. They are nailed at their ends into door posts 7 and 8, the nails being indicated at 9.

Any suitable type of nail may be used, but slating nails have been found satisfactory. Commercial steel strap with a row of spaced nail-holes is preferred and is indicated in the drawing.

Before applying the twelfth or top strap, one edge of the paper sheet 11 is folded upon itself as indicated at 12 and the top strap is laid in the fold. The sheet with the strap laid in the fold is then applied to the doorway, nails being driven through both plies of paper and the infolded strap. It is considered better to place the fold outward as shown in Figs. 1 to 3.

With the top strap at the maximum grain door height and a reasonable fold depth, there will be enough paper to form a flap 13 at the floor by folding at 14.

Both vertical edges of the paper are battened down by straps 15, preferably identical with the straps 6, nailed as indicated at 16. The flap 13 is battened down by a strap 17 nailed as indicated at 18. The vertical batten straps should overlie the door posts 7 and 8, and if the length of the horizontal straps 6 or the width of the paper 11 exceeds the width over the door posts they simply project harmlessly beyond one or both of the batten straps.

The batten straps assure a seal, and the actual extremities of the paper need not be fastened.

Suitable steel strap is $\frac{3}{4}$ inch wide and about 0.015 inch in thickness and has a tensile strength of about 1160 pounds. A satisfactory paper is known in the trade as "kraft paper .17, pop test 160 pounds to the square inch." A somewhat better paper is "No. 1 high grade .15 kraft paper,

pop test 160 pounds to the square inch". The second paper is substantially water-proof, costs little more, and hence is preferred.

The papers described above can be rolled without injury, and in practice the door components are prepared for transmission to the job by rolling one or two paper sheets around an appropriate number of straps, say fifteen for one sheet or thirty for two sheets. Such a package is indicated in Fig. 6. It may be tied or taped and is convenient to handle.

While the invention has been described in detail, this description is intended to be illustrative rather than limiting, the scope of the invention being defined in the claims.

What is claimed is,—

1. The combination of a car structure having a doorway; a grain door comprising a plurality of substantially horizontal spaced straps stretched across the doorway and fastened at their ends to the car structure; a sheet of paper or like material sustained against outward pressure by said straps, the straps acting chiefly in tension; and battens overlying the side and bottom marginal portions of said sheet and connected therethrough to the car structure.

2. The combination defined in claim 1 in which the upper margin of the sheet is folded upon itself around the top one of said straps, and the top strap with the two piles of the sheet are connected as a unit with the car structure.

3. A grain door structure, comprising a flexible sheet of paper or the like, and a series of horizontal, spaced straps of steel or the like serving to reinforce the paper, the straps and paper each acting when in use nearly exclusively in tension to resist pressure; and means for attaching the ends of the straps and the side and lower margins of the sheet to a car doorway structure, and for clamping the paper grain-tight thereto.

4. A grain door unit for use in box cars, comprising a plurality of flexible steel straps strong enough to resist the pressure exerted by grain in a car when stretched across the doorway and acting in tension; and at least one sheet of paper large enough to overlap the side and lower margins of the doorway and afford the required height; strong enough to resist the grain pressure when sustained by said straps stretched across the doorway in spaced relation, and flexible enough to be rolled without injury; said straps and paper being rolled into a package for transportation or storage as a self-contained unit prior to use.

5. A grain door applicable to cars having doorways, and arranged to develop its load resisting strength chiefly in tension, said door comprising a flexible sheet such as tough paper capable of being rolled; spaced flexible reinforcing straps such as steel straps; and means for attaching the straps and the paper to marginal portions of the doorway, said attaching means being adapted to produce substantially grain-tight seal of the paper to such marginal portions, and to sustain the straps against stresses transmitted thereto by said sheet.

6. A grain door applicable to cars having doorways, and arranged to develop its load resisting strength chiefly in tension, said door comprising a flexible sheet of tough substantially waterproof paper; spaced flexible reinforcing straps having a greater resistance to stretching than has said paper; and means for attaching the straps and the paper to marginal portions of the doorway, said attaching means being adapted to produce substantially grain-tight seal of the paper to such marginal portions, and to sustain the straps against stresses transmitted thereto by said sheet.

HERBERT CORKRAN. 40