Feb. 25, 1936. J. E. HOOPER 2,032,068

LOCOMOTIVE CAB CURTAIN

Filed Nov. 23, 1934 2 Sheets-Sheet 1

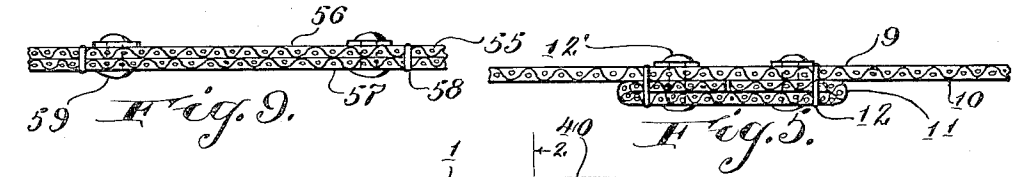


Fig. 9.

Fig. 5.

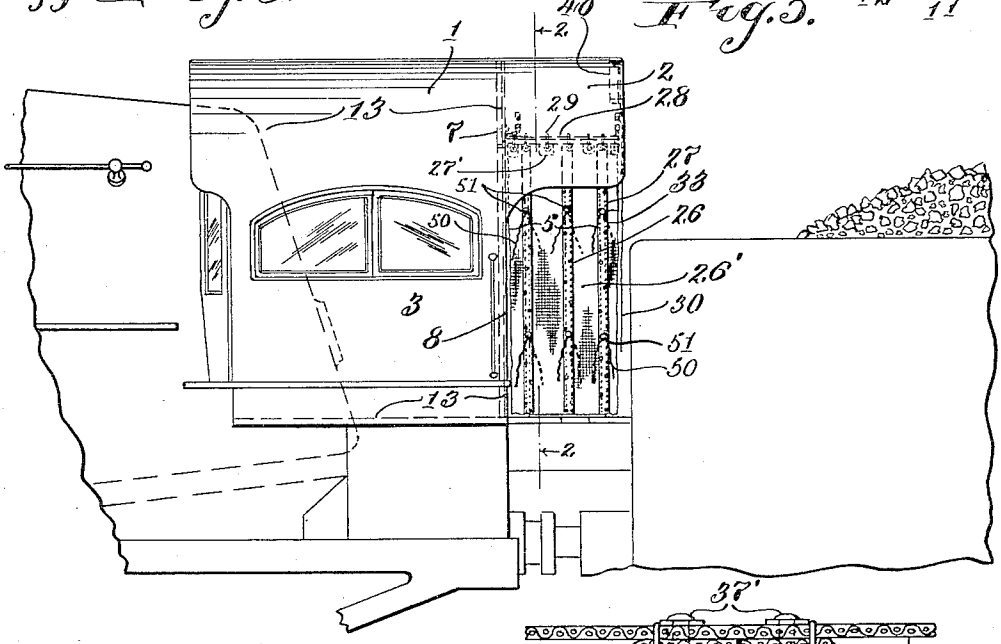


Fig. 1.

Fig. 7.

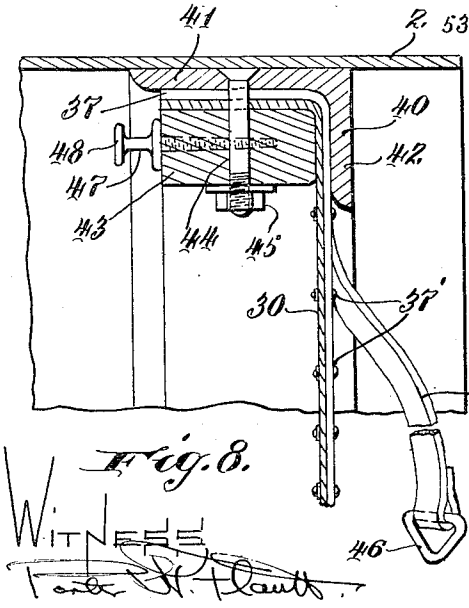


Fig. 8.

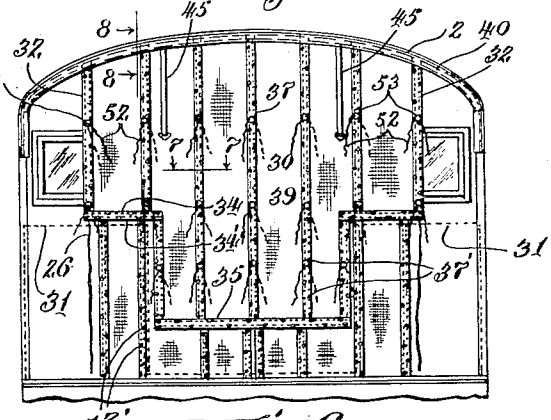


Fig. 6.

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LOCOMOTIVE CAB CURTAIN

Filed Nov. 23, 1934 2 Sheets-Sheet 2

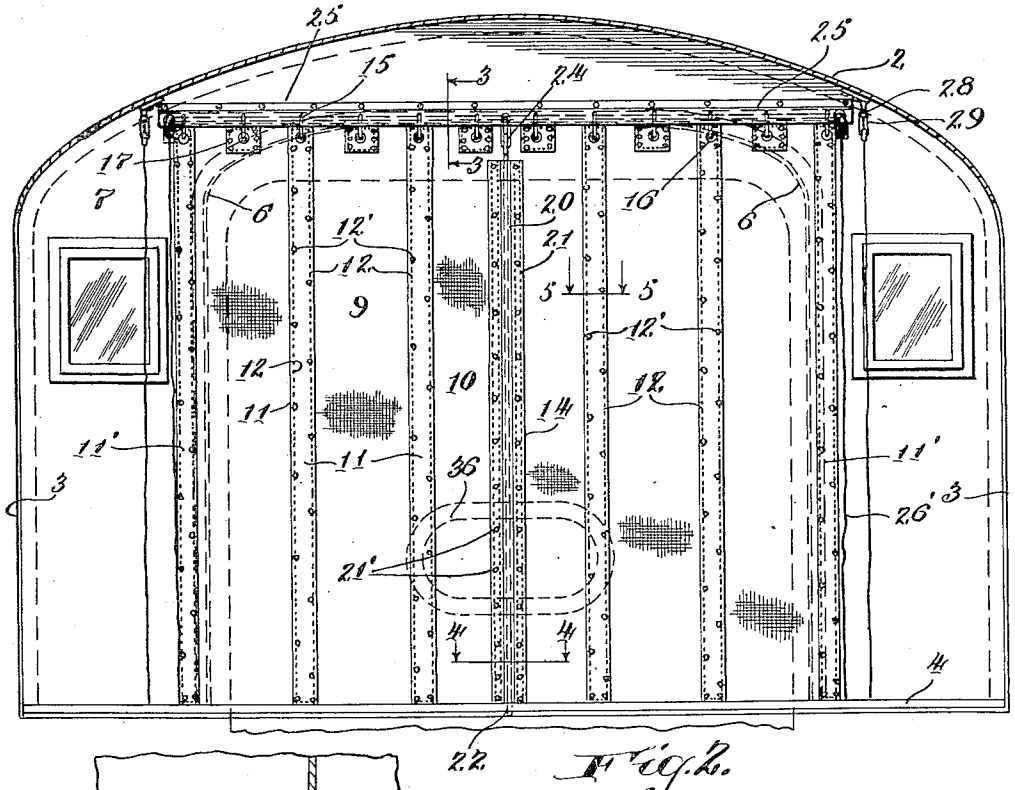


Fig. 2.

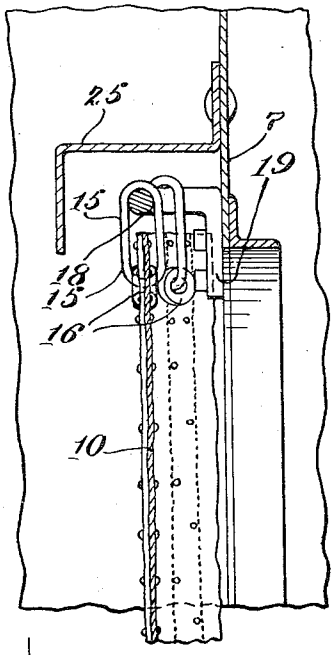


Fig. 3.

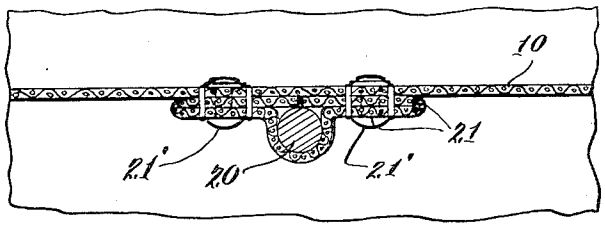


Fig. 4.

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UNITED STATES PATENT OFFICE

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LOCOMOTIVE CAB CURTAIN

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Application November 23, 1934, Serial No. 754,475

14 Claims. (Cl. 156—10)

The cabs of steam locomotives are of necessity constructed with a wide opening five or six feet high at the rear to provide for passing coal from the tender to the fire-door of the furnace and also to provide for the free use of a long hand slicer bar or poker in tending the fire. The cab is not only open directly to the rear but at the sides back of the side windows for free entrance and exit of the engineer and fireman or other occupant of the cab. This open construction of the cab results in cold weather, particularly at high speeds, in serious hardships to the occupants of the cab, and various attempts have been made to provide closures which will not interfere either with firing or with entrance to and exit from the cab. These closures have been most generally in the form of curtains of canvas or duck or other textile or similar fabric. Such curtains have not proved satisfactory due to the fact that in use they are soon destroyed by the action of the gases which escape from the fire through the fire-door during feeding fuel to the fire, and other stoking operations, or burned by contact with the hot poker or hand slicer bar. Also these canvas curtains, being of relatively light material, are easily displaced by the draughts at high speed, and when weakened by the action of the gases and burning by contact with the poker, they are quickly torn and destroyed by the wind. Also as arranged, they do not afford the requisite protection, even when in good condition, and do not afford easy access to the fuel supply in the tender for presentation of the same to the fire door, and they do not protect the interior of the cab during firing being so constructed that they must be thrown back opening the cab completely to the rush of wind incident to running even at normal speeds.

The object of the present invention is to provide a curtain which is proof against destruction or weakening by furnace gases, and also against weakening or destruction by burning, as by contact with the hot poker or slicer bar, or in any other way.

A further object of the invention is to so construct and locate and arrange the curtains for closing the rear of a locomotive cab as to provide for firing without completely exposing the inside of the cab to the outside air, and also to provide a complete enclosure at the rear of the cab which is effective between firing intervals to exclude both the cold air from without and the hot air from the furnace, maintaining a normal temperature.

In the accompanying drawings I have illustrated so much of a locomotive cab equipped with protecting curtains in accordance with the invention as is necessary to a complete understanding of the invention, and the method of constructing, applying and using the same.

In the drawings Figure 1 is a side elevation of a locomotive cab with a fragment of the boiler and tender in operative relation thereto, the cab being equipped with the curtain of the invention.

Figure 2 is a section on the line **2**, **2** in Figure 1 showing the main curtain in elevation, the view being taken in a direction looking forwardly.

Figure 3 is a section on the line **3**, **3** in Figure 2.

Figure 4 is a section on the line **4**, **4** in Figure 2.

Figure 5 is a section on the line **5**, **5** in Figure 2.

Figure 6 is a rear elevation of the cab showing the hood or rear curtain and a portion of the main curtain beyond the hood curtain.

Figure 7 is a section on the line **7**, **7** in Figure 6.

Figure 8 is a section on the line **8**, **8** Figure 6.

Figure 9 is a section corresponding to the section Figure 5 showing an alternative construction of curtain.

Referring to the drawings by numerals, each of which is used to indicate the same or similar parts in the different figures, all of the curtains are preferably composed of woven asbestos fabric which may to advantage be of a weight of 40.7 ounces to the square yard. This fabric is not attacked in any way by the furnace gases or products of combustion, and is highly resistive to heat, and when reinforced in the manner described, it is sufficiently strong to last indefinitely. The cab **1** is of the usual construction, having a laterally curved sheet metal roof or hood **2** which as shown is continuous with the side walls **3** which are secured at the bottom to the floor structure **4**. The side walls are cut away at the rear substantially up to to their line of junction with the roof **2** providing side openings **5** for the entrance and exit of the occupants of the cab, and the cab has a rear opening shown in dotted lines in Figure 2 at **6** which is formed in the rear wall **7** of the cab which extends transversely substantially in the plane of the rear edges **8** of the side wall **3**, or the front of the side opening **5**. This rear opening **6** is covered by a main curtain **10** which consists of one or more pieces of woven asbestos fabric **9** giving a curtain which is preferably a single integral curtain of a total area somewhat larger than the opening so as to overlap the opening providing a margin of a few inches at the top and sides. This asbestos fabric **9** is reinforced in the preferred form shown by any

suitable number of strips 11 of flexible materal. In the practice of the invention up to the present time heavy cotton duck has been used for the purpose. These strips may be two or three inches in width or of any suitable width, being riveted as shown at 12' and sewed along their longitudinal folded edges by seams 12 extending through the duck or other material forming the strips and through the asbestos fabric. The duck used for this purpose may be treated in any suitable manner to make it weatherproof and mildew proof, the cuprammonia treatment which is known to the textile art giving a satisfactory result. In the practice of the invention the reinforcing strips 11 have been so treated.

The use of the rivets 12' in this instance is very important in that they hold the asbestos fabric curtain 9 and its respective reinforcing strips 11 together in a positive manner irrespective of heat, moisture and acid conditions, thus preventing the curtain structure and its reinforcing strips from going to pieces upon the burning or rotting out of the threads forming the seams 12.

In the form shown there are six of the strips 11 and an additional reinforcing strip 14 at the center to be further described.

Along the top of the curtain suitable slide fasteners are provided, shown in the form of elongated eyes or rings 15. These are passed through grommets 16 seated in the fabric at the top, the grommets being preferably secured near the upper ends of the strips 11, and if desired additional grommets 16 and eyes or rings 15 may be secured at the center of reinforcing patches 17 of treated duck at the top between the upper ends of the strips 11. It is also of interest that one strip 11' of the strip 11 is located at each edge of the asbestos fabric 9 of curtain 10 to provide reinforcement as to the edge portion.

The elongated rings or eyes 15 engage a carrier rod 18 at the top which is passed through the rings and secured to the rear wall 7 above the opening 6 at each side, the ends of the rod 18 being flattened and turned downwardly or in any preferred direction providing lugs 19 which are fastened to the wall 7, and the rod 18 is preferably curved in a horizontal plane at each end to space the main portion of the rod away from the wall 7 to provide for the free movement of the curtain.

At the center a vertical stiffening and supporting rod 20 is provided. This is enclosed between a duck or other suitable fabric strip 21 folded as shown which is sewed and riveted by rivets 21' to the asbestos fabric sheet 9 extending in a vertical direction, see Fig. 4. This rod is removably seated as to its lower end in a hole 22 in the cab floor at the center of the opening 6, and at the top it is engaged with a ring or eye 24, which is preferably like the rings or eyes 16 through which ring 24 the supporting rod 18 is passed. In opening the curtain the rod 20 may have its lower end removed from the hole or seat 22, whereupon the rod is free to be moved in a lateral direction as the curtain is slid to either side to open it to provide for the moving of coal from the tender to the fire-door for feeding the fire or any other reason.

It being fully understood that the main curtain 10, may be made up into more than one piece, such as being divided at the center, thus forming two separate halves or sections each section being provided with reinforcing strips and stiffening means similar in structure to the above described reinforcing strips 11 and the rod member 20 and its supporting fabric strip 21. This type of curtain structure allowing for the separate sections of the curtain to be moved away from each other at the center of the opening 6, permitting variable sized openings to be formed in the center of the curtain structure. The stiffening rod members 20 may to advantage be positioned at the sides of the curtain or curtains used to cover the opening 6 of the cab structure. Immediately above the rod 18 and substantially parallel to the same a Z section bar 25 is secured to the rear face of the rear wall 7 of the cab, so that it extends outwardly in a horizontal direction over the rod 18 and downwardly in a vertical plane beyond the rod as shown at 25 in Fig. 3. The Z section or plate serves as a protection, preventing the free entrance of air at the top of the curtain from entering the cab proper, also protecting the rings 15 and the top edge of the curtain from destructive contact with the poker or slicer bar.

In Figure 1, I have shown side curtains 26 which are also of asbestos fabric with vertical reinforcing strips 27 of duck. These are preferably treated as are the strips 11 to make them waterproof and mildew proof and otherwise weatherproof.

The curtain as shown is suspended on the inside of the hood on a rod 28 similarly arranged to the rod 18, and the rings 29 are also similarly arranged. Also similar rings are shown secured to patches 27' similar to the patches 17 in Figure 2. The curtains 26 are suspended from the inside of the hood 2 the rod 28 being secured at its ends to the inside of the hood above the side openings 5, so that when expanded to normal closed position, the side curtains 26 cover and close the side openings 5 extending down to the floor as does the main curtain 10. The rear portion of the cab back of the main curtain 10 is separated or closed off from the main chamber 13 within the cab by the main curtain 10, and the side openings 5 being closed by the side curtains 26, a complete enclosure of the rear portion 26' of the cab back of the rear partition or wall 7 is effected by the curtains 10 and 26 together with the rear or hood curtain 30, best illustrated in Figure 6. It should be noted in this connection that the curtains 26 are spaced inwardly from the sides of the cab by a distance shown as approximately one foot and a half, see Fig. 6. In this figure the water legs 31 which extend forwardly at each side of the tender from the main water tank are indicated in dotted lines. The rear curtain 30 is as is shown secured to the under side of the roof or hood 2 adjacent the rear edge of this roof in a manner to be further described. This curtain hangs vertically with its side edges 32 substantially in contact with the rear edges 33 of the side curtains 26 down to a point where the curtain has a horizontal jag or shoulder 34. This jag or shoulder presents a bottom edge 34' extending inwardly toward the center and of a height which brings it substantially in contact with the top of the water leg 31. Immediately adjacent the inside vertical wall of the water leg 31 and at the inner end of the edge 34 the curtain 30 extends directly downwardly in a vertical line to the bottom edge 35 which is shown as spaced some eight or ten inches above the floor. This permits the curtain to hang freely between the water legs and provides an opening or space at the bottom which permits the shov-

elling of coal from the tender beneath curtain **30** without raising or pushing the curtain backwardly. By pushing the main curtain to one side and opening the firedoor **36** the way is opened for feeding the fire with coal from the tender without disturbing the rear or hood curtain **30** and without throwing the inside of the cab open to the free and unchecked entrance of cold drafts from the outside assuming that the locomotive is going at high speed during feeding and being operated in cold weather. This is of great advantage to the fireman as he is thus given substantial protection from the weather at all times when desired.

The rear or hood curtain **30** is formed with vertical reinforcing strips **37** as are the other curtains, which strips are preferably of duck which is to the best advantage treated as already described to render it waterproof, weatherproof and mildew proof. These strips like the previous strips are riveted as shown at **37'** and sewed in a folded or lapped position to the main body of the curtain, see particularly Figure 7 of the drawings which is preferably of asbestos fabric, by longitudinal lines of stitching and rivets and the edges of the curtain are similarly reinforced with strips attached to the asbestos fabric along the edge of the curtain. The manner of suspending the rear or hood curtain **30** from the hood or roof **2** is best illustrated in Fig. 8. An angle iron **40** is secured to the under side of the hood or roof **2** extending transversely thereof, adjacent the rear edge of the roof. The angle iron has one flange **41** lying flat against the under-surface of the roof, the other flange **42** extending downwardly in a vertical direction. A supporting bar **43** is secured to the angle iron **40** on the inside substantially filling the angle between the flanges **41** and **42**. This supporting bar as shown is removably secured by means of bolts **44** and nuts **45**, the bolts extending downwardly through the bar and the nuts engaging the under side of the bar. The top edge of the curtain is clamped between the supporting bar **43** and the flanges **41** and **42** being held by friction incident to the tightening of the nuts **45**. Any suitable means of securing the top edge of the curtain may be substituted for the construction shown. In the form illustrated the top edge of the curtain is quickly and easily removed for replacement or for other purposes and is securely held against accidental displacement. The reinforcing strips **37** are shown as overlying the edge of the curtain at the top between angle iron **40** and the asbestos sheet **39**. For convenience in holding the curtain rolled when not in use straps **45** are provided. These are clamped at one end between the asbestos fabric **39** of which the curtain is mainly composed and the angle iron **40** being preferably located between the spaced strips **37** as illustrated in Fig. 6. The straps **45** are provided at their free ends with angular eyes or rings **46** which are adapted to engage projecting studs **47** which are seated in the bar **43**, being arranged horizontally and having flanged outer ends **48** to prevent the displacement of the eyes **36**.

When the curtain is not in use, i. e., if it is desired to leave the rear of the space **26'** open, the curtain **30** is rolled about its bottom edge or otherwise folded. The straps **45** are passed around the rolled curtain and the eyes **46** are engaged with the studs **47** to support the roll.

For purposes of raising the respective side and rear curtains **26** and **30** a predetermined desirable distance from the floor of the cab, these curtains may each be respectively provided with reefing ropes **50** and **52** and reefing eyelets **51** and **53**, the same being used in a reefing manner for raising these curtains in a manner as above set forth. It being understood that any preferred form of reefing ropes and eyelets may be used to advantage in this instance.

The modified form of the curtain structure of the invention shown fragmentarily in Figure 9 of the drawings illustrates another from of this portion of the invention whereby the curtain **55** composed of an inner facing of asbestos fabric **56** may have a reinforcement **57** of a woven vegetable fabric, such as cottonduck or the like, the same being treated to render it immune from acid fumes, moisture and mildew in a similar manner as set forth hereinbefore as to the reinforcement strips **11** and **37**. This reinforcement **57** may be properly attached to the asbestos fabric **56** by means of seams **58** and rivets **59** and may cover large predetermined areas of the back face of the curtain proper or the whole back face and area of the curtain may be completely covered and reinforced by this reinforcing fabric **57**, thus allowing for unusual strength and desirability to this type of modified form of curtain.

The operation of the invention has been quite fully described in connection with the description of the structure. At any time, as when the locomotive is running, particularly in cold weather, it may be desirable to close the rear end of the cab. For this purpose the curtain **10** is extended or drawn to cover the opening **6**. The side curtains **26** when drawn or extended cover the side openings **5** and the rear or hood curtain **30** when extended or drawn closes the rear opening from one side curtain **26** to the other and overlying the water legs **31** and extending downwardly between the legs the bottom edge **30** being spaced from 6 inches to a foot above the floor, the four curtains enclosing space **26'**. When it is desired to open the rear space **26'** enclosed by the curtains the rear curtain **30** may be rolled up, the side curtains **26** pushed forwardly and collapsed or folded against the wall **7**, and the main curtain **10** may be gathered at either side, the center rod **20** being released from the socket **22** and pushed to the side along the bar **18** or the rod **20** may be left in position under some circumstances and the curtain folded toward the center. Under these circumstances the area **26'** is thrown completely open.

When the curtains are extended as first described to cover the various openings and enclose the space **26'** if it is desired to fire the locomotive and at the same time to cut off the draft and prevent outside air from entering the cab, the main curtain **10** is folded to either side. The fireman standing in the space **26'** removes coal from the tender operating his shovel beneath the bottom edge **35** of the curtain **30** and passes it forwardly through the fire door without the necessity of removing the curtain **30** which affords sufficient protection against the draft due to running speed and wind, and particularly against the entrance of air in cold weather. Between stoking operations, the cab may be tightly closed by extending the curtain **10** to cover the opening **6**, the other curtains being drawn so that the engineer and fireman may remain in comfort within the cab enclosure **13**, or if desired the space **26'** enclosed by the curtains may be utilized for this purpose. Here the heat of the furnace is less intense and the out-

side air is excluded. When the occupants of the cab desire to enter or leave the cab either of the curtains 26 may be folded forwardly or drawn aside to make the opening 5 passable.

It is of great importance that all of the curtains being composed mainly of woven asbestos sheet fabric or of other types of asbestos sheet material, are proof against the gases which escape from the furnace during firing and at other times. These gases have the effect of weakening and deteriorating vegetable or wool fabric curtains which when thus deteriorated or weakened are destroyed by the draft. Also the asbestos fabric as herewith presented affords efficient resistance to burning by contact with hot pokers and slicer bars used in stoking. While asbestos sheet and asbestos fabric as ordinarily used would not be satisfactory for this purpose, the manner of reinforcement as described herein retains the flexibility of the curtain and gives it sufficient tensile strength so that the curtains last indefinitely, the reinforcing material being placed on the outside of the curtain, for protection from the gases and from contact with hot implements used in stoking so that durability and length of life is in no wise impaired by the conditions which make the use of vegetable fiber fabric curtains for this purpose impracticable and unsatisfactory; further, treatment of the vegetable fabric material or duck used for reinforcing strips whereby it is rendered mildew proof and weather proof, prevents deterioration of the reinforcing material due to the exposure to weather for an indefinite period.

However in view of the above reference to asbestos being used for the curtain proper the invention is not necessarily limited to the use of this specific material alone, as it is fully appreciated a light cotton duck material may be used to advantage in the place of the asbestos portions of the curtain the said cotton duck being specially treated to render the same fire proof, mildew proof and weather proof.

I have thus described specifically and in detail a locomotive cab curtain construction embodying the features of the invention specifically and in detail in order that the manner of constructing, applying, operating and using the invention may be fully understood, however, the specific terms herein are used descriptively rather than in a limiting sense, the scope of the invention being defined in the claims.

What I claim as new and desire to secure by Letters Patent is:

1. A locomotive cab curtain composed of a flexible asbestos sheet having a reinforcement of asbestos fabric consisting of vegetable fiber, the reinforcement being distributed with substantial uniformity over the entire area of the asbestos sheet and being secured to the asbestos fabric on the outside, the reinforcement being protected from the furnace gases and from contact with the hot implements in stoking by the asbestos fabric.

2. A locomotive cab curtain composed of flexible asbestos fabric with reinforcing strips of fabric composed of vegetable fibers secured to the asbestos fabric on the outside.

3. A locomotive cab curtain composed of flexible sheet asbestos with reinforcing strips of fabric composed of fibers of an organic material secured to the asbestos sheet on the outside, the reinforcement being protected by the asbestos from the furnace gases and from contact with hot stoking implements used in the cab.

4. A locomotive cab curtain composed of flexible sheet asbestos and reinforcing strips of cotton duck spaced apart and distributed with substantial uniformity over the entire area of the asbestos sheet, the reinforcement being secured to the sheet asbestos on the outside whereby the reinforcement is protected by the asbestos from furnace gases and other destructive agencies on the inside of the cab.

5. A locomotive cab curtain composed of flexible sheet asbestos and having reinforcing strips of cotton duck spaced apart and distributed substantially over the entire width of the curtain and extending substantially the entire length of the curtain, being secured thereto and located on the outside of the asbestos sheet whereby they are protected from furnace gases and other destructive agencies on the inside of the cab, the reinforcing strips being specially treated and rendered weatherproof and waterproof.

6. A locomotive cab curtain consisting of flexible woven asbestos sheet and reinforcing strips of fabric composed of vegetable fibers secured to the asbestos sheet material and located on the side of the asbestos away from the inside of the cab, the strips extending vertically the entire length of the curtain and being protected from the gases on the inside of the cab by the asbestos sheet.

7. A locomotive cab curtain of flexible sheet asbestos and reinforcing strips of fabric composed of vegetable fibers secured to the asbestos sheet material extending vertically the entire length of the curtain, and means on the curtain for suspending the same at the top, said means being secured to the ends of the reinforcing strips which are located on the outside of the asbestos sheet.

8. A locomotive cab curtain of flexible woven asbestos and reinforcing strips of fabric composed of organic fibers secured to the asbestos sheet material extending vertically the entire length of the curtain, and means on the curtain for suspending the same at the top, said means being secured to the ends of the reinforcing strips, the material composing the reinforcing strips being specially treated whereby it is rendered mildew proof and weatherproof, the reinforcing strip being located on the outside of the curtain.

9. The combination of a locomotive cab having a rear wall with an opening therein for entrance and exit of the cab occupants and for passing coal, and a curtain structure consisting of a main curtain to cover said opening and suspended at the top to slide sideways, the roof of the cab extending rearwardly beyond said wall, and the cab having side walls which are discontinued beneath said roof providing side openings for the passage of the occupants of the cab, side curtains suspended over said latter openings and sliding in a fore and aft direction and a rear curtain suspended from the rear edge of the roof and mounted to slide and fold in a lateral direction, the bottom edge of the rear curtain being spaced upwardly from the floor of the cab to provide for shovelling coal beneath the latter mentioned curtain.

10. The combination with a locomotive cab having a rear wall with an opening therein for entrance and exit of the cab occupants and for passing coal of a main curtain covering said opening and suspended at the top to slide and fold laterally, the roof of the cab extending rearwardly beyond said wall, the cab having side walls

which are discontinued beneath said roof providing side openings for the passage of the occupants of the cab, side curtains suspended over said openings to slide and fold in a fore and aft direction and a rear curtain suspended from the rear edge of the roof and mounted to slide and fold in a lateral direction, the bottom of the rear curtain being spaced upwardly from the floor of the cab to provide for shoveling coal beneath the curtain, the rear curtain being of reduced width at the bottom to permit it to swing forwardly between the water legs of a tender which are located at each side.

11. A locomotive cab curtain of flexible sheet material comprising mainly asbestos, and reinforcing strips of fabric composed of vegetable fibers secured to the asbestos sheet material extending vertically the entire length of the curtain, and means on the curtain for suspending the same at the top, said means being secured to the ends of the reinforcing strips, the material composing the reinforcing strips being specially treated whereby it is rendered mildew proof and weather proof, the reinforcing strips being located on the outside of each curtain where they are protected from destructive agencies within the cab.

12. A locomotive cab curtain of flexible sheet material comprising mainly asbestos and reinforcing strips of fabric composed of vegetable fibers secured to the asbestos sheet material extending vertically and substantially the entire length of the curtain, the material composing the reinforcing strips being specially treated whereby it is rendered mildew proof and weatherproof, said reinforcing strips being located on the outside of the curtain to protect the reinforcement from destructive agencies within the cab, said strips extending the entire length of each curtain in a vertical direction and having sliding members secured to the ends of said strips at the top by which the curtain is suspended.

13. A locomotive cab curtain adapted to close the rear of a locomotive cab, the same comprising a sheet of fire proof fabric with a reinforcement of vegetable fiber fabric distributed with substantial uniformity over the outside of the curtain, the curtain having means whereby it is suspended at the top and adapted to slide laterally and a central supporting rod similarly suspended at the top and adapted to slide laterally, said rod being vertical and secured to the curtain substantially its entire length, and serving as a central support for the curtain, the lower end of the rod being adapted to be removably seated in a socket in the floor of the cab at the bottom and removed therefrom and slid sidewise with the curtain.

14. A locomotive cab curtain composed of flexible woven fire resisting fabric with a reinforcement of fabric composed of vegetable fibers secured to the fire resisting fabric on the outside, both the said fire resisting fabric curtain and its reinforcement having means for rendering the same substantially free from the usual deteriorating effects of acid fumes, moisture and mildew.

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