Feb. 19, 1946. L. SCHEPMOES 2,395,073

WINDOW CONSTRUCTION

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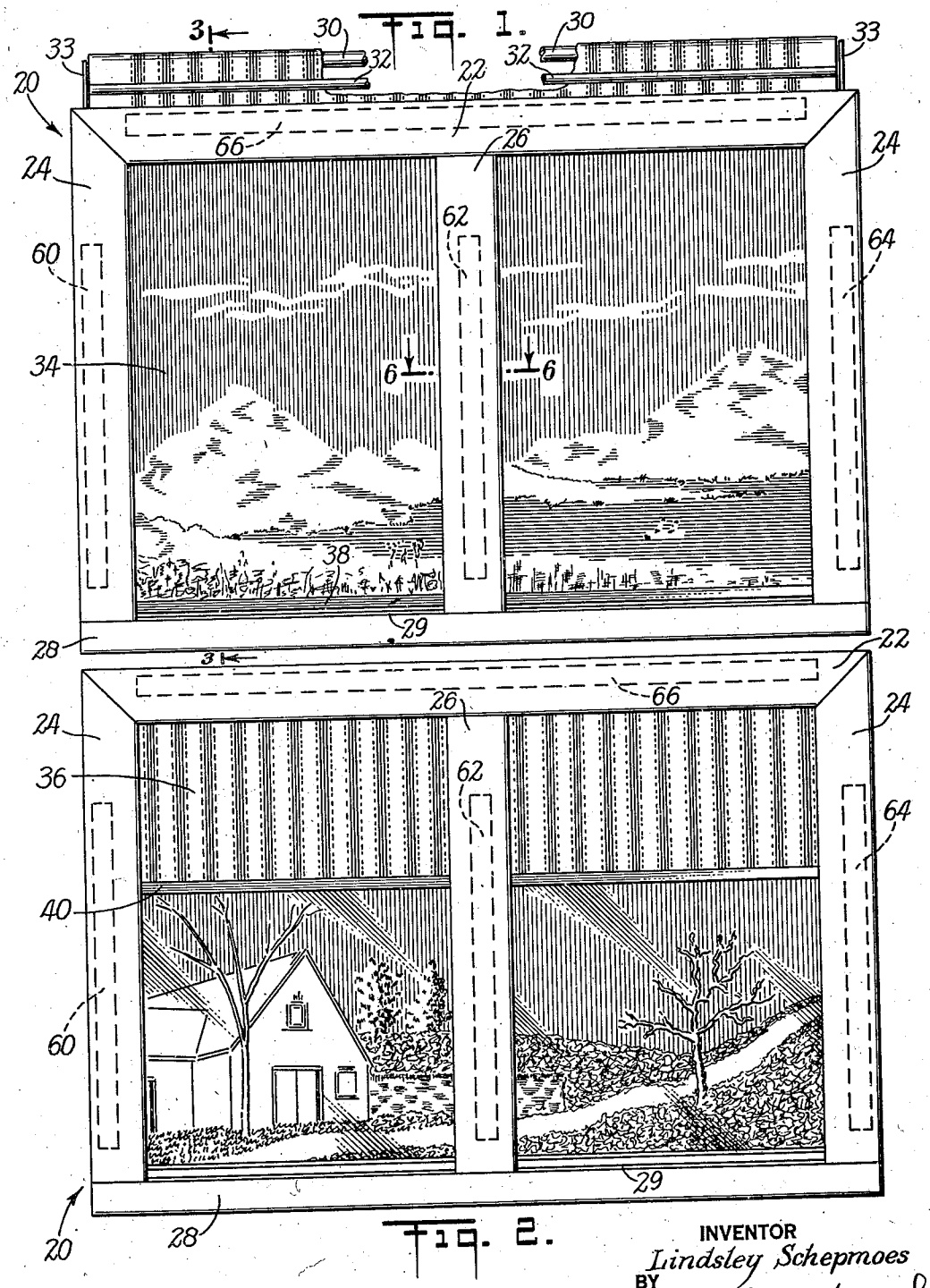


FIG. 1.

FIG. 2.

INVENTOR
Lindsley Schepmoes
BY
Blair, Curtis & Hayward
ATTORNEYS

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Fig. 3.

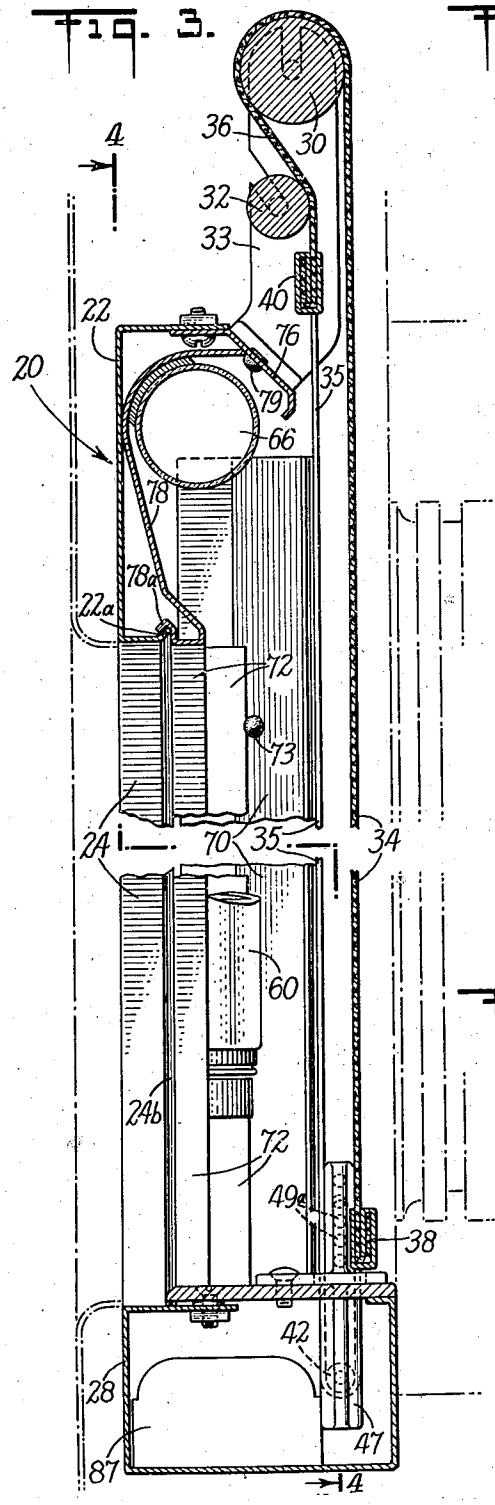


Fig. 4.

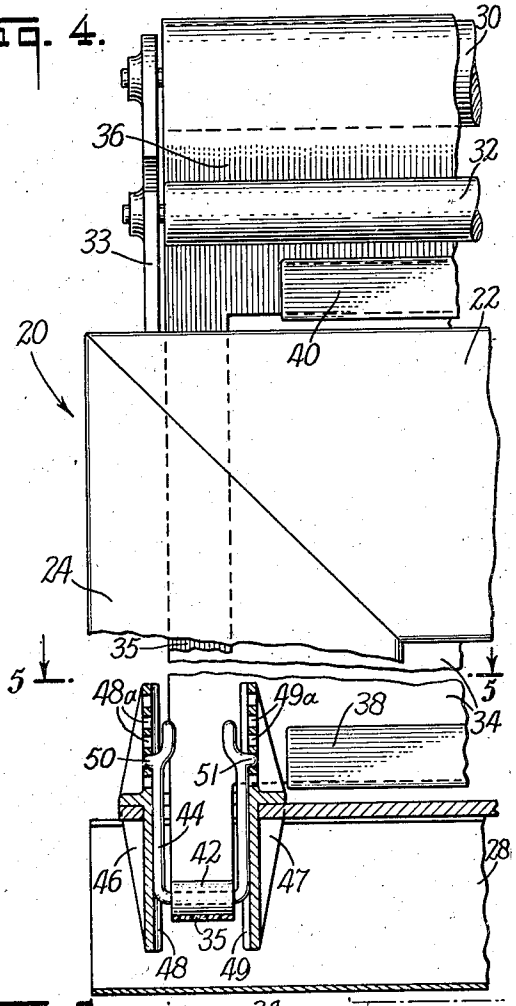
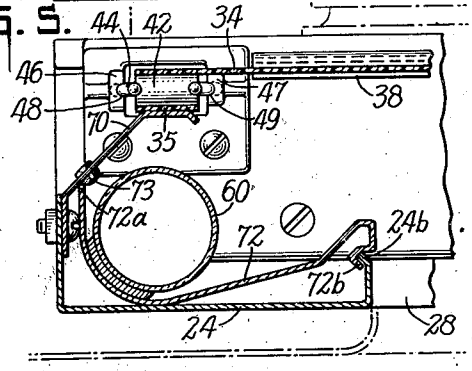


Fig. 5.



INVENTOR
Lindsley Schepmoes
BY
Blair, Curtis & Hayward
ATTORNEYS

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Fig. 6.

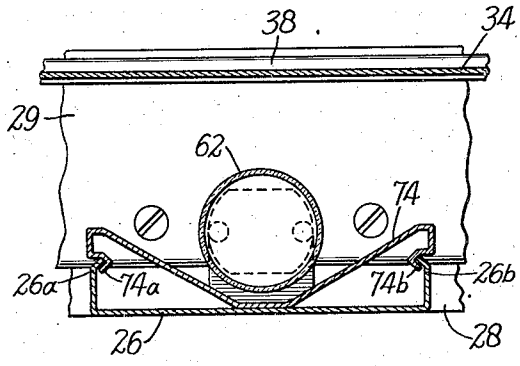
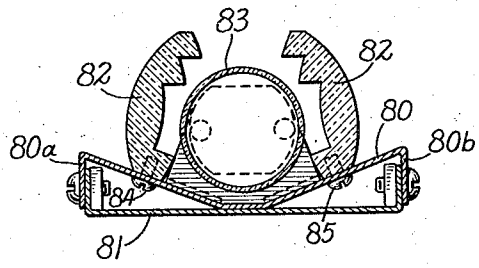


Fig. 7.



INVENTOR
Lindsley Schepmoes
BY
Blair, Curtis & Hayward.
ATTORNEYS

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UNITED STATES PATENT OFFICE

2,395,073

WINDOW CONSTRUCTION

Lindsley Schepmoes, New Haven, Conn., assignor to The Safety Car Heating and Lighting Company, Inc., a corporation of Delaware

Application June 18, 1943, Serial No. 491,423

7 Claims. (Cl. 160—85)

This invention relates to window constructions and the like and, with regard to its more specific features, to constructions which combine a practical indirect lighting system with a window of more or less conventional appearance.

It is an object of the present invention to provide apparatus of the character described having to a notable extent the characteristics and capabilities set forth. Another object is the provision of a window construction whereby the interior of a room or compartment may be illuminated at night in a manner approximating the illumination afforded by the window during the day. An additional object is the provision of a double window shade having two distinct portions, one for use during the day to control the natural light admitted and the other for use at night to serve as a source of indirect illumination. A further object is the provision of a window construction whereby the window serves to give light to a room by day or by night. Other objects will be in part obvious and in part pointed out hereinafter.

The invention accordingly consists in the features of construction, combinations of elements and arrangements of parts as will be exemplified in the structure to be hereinafter described, and the scope of the application of which will be set forth in the accompanying claims.

In the accompanying drawings, in which exemplary embodiments for achieving the above objectives are set forth and in which similar reference characters refer to corresponding parts:

Figure 1 is an elevational view of a window unit embodying the invention as it appears at night while serving as a source of indirect illumination;

Figure 2 is an elevational view of the window unit shown in Figure 1 but presenting its appearance by day when daylight is entering from the outside;

Figure 3 is a vertical sectional view, with parts broken away, taken along the line 3—3 of Figure 1 in the direction of the arrows;

Figure 4 is a fragmentary sectional view taken along the irregular line 4—4 of Figure 3;

Figure 5 is a fragmentary sectional view taken along the line 5—5 of Figure 4;

Figure 6 is a sectional view taken along the line 6—6 of Figure 1; and

Figure 7 is a view similar to that of Figure 6 but presenting a modification of the invention.

The drawings illustrate by way of example satisfactory forms that the invention may take for application in the window construction of a passenger railway car. Heretofore a variety of constructions have been attempted with varying success. Any enclosure which is decorated with an eye to its appearance under natural illumination from outside through windows loses some of its attractiveness when lighted by means of scattered light sources therein, and this is especially true of the many relatively small rooms and compartments found on a railway car. Thus, the general illumination which comes in naturally by day is not adequately approximated at night by several wall and overhead fixtures which the space considerations have necessitated.

The present invention is particularly well-suited to lighting wherever space is at a premium because it provides for the use of space-saving flourescent tubing in a novel light-distributing combination so that the advantages of the tubes may be fully realized, and at the same time their light may be used indirectly to approximate a natural illumination retaining the relative decorative values of lights and shadows at all times.

With reference to Figure 1, a unitary frame for one window, generally indicated at 20, is illustrated consisting of a head 22, jambs 24, a mullion 26, and a sill 28 (see also Figure 2). Across the top of the frame in brackets 33 are mounted a roller 30 and an idler 32 for supporting a double window shade. This double shade consists of a night portion 34 shown covering the window openings in Figure 1 and illustratively carrying a mountain lake scene, and a day portion 36 shown in part in Figure 2 and carrying, as shown, vertical stripes. The bottom edge of night portion 34 is reinforced with a shade binding 38, whereas the bottom edge of day portion 36 is reinforced with a shade binding 40.

With reference to Figure 3, rollers 30 and 32 are shown in cross section supported by bracket 33 at the uppermost part of the figure, and day portion 36 of the double shade is shown extending upwardly from binding 40, behind idler 32, over rollers 30 and then downwardly to meet night portion 34, which latter portion extends to the bottom of the window opening. Day portion 36 is seen to be continuous with night portion 34; and when night portion 34 is raised, day portion 36 comes into sight below the edge of head 22 so that the day portion may be adjusted to regulate the amount of light admitted through the window.

The shade is held taut in whatever position it is adjusted by means of an endless tape-like portion 35 on each side of the shade (see Figures

3 and 4). Each tape-like portion **35** extends downwardly from binding **40** to a point near the bottom of the window, passes around a tape-tensioning roll **42**, and then extends upwardly to binding **38** and along the side edge of the shade. In the embodiment illustrated the tape-like portions are formed as an integral part with the rest of the double shade but obviously they might be formed, in whole or in part, by the addition of separate tapes.

Each tension roll **42** (see Figure 4) is carried by a U-shaped yoke **44**. Yoke **44** is slidable in supports **46** and **47** provided, respectively with yoke guideways **48** and **49**. The two arms of the yoke carry nubs **50** and **51** which may be caused to engage with selected openings **48***a* and **49***a* in guideways **48** and **49** so that the position of the tape-tensioning roll can be adjusted vertically to give the proper tension in the tape-like portion. The yoke **44** may thus be readjusted whenever necessary to take up any slack resulting, for example, from stretching of the tape-like portion.

Night portion **34** of the double shade (see Figure 1) in the embodiment illustrated carries a decorative scene which may be applied with luminescent paint to give a highly reflective surface for the light as will be more fully understood later. Obviously the precise scene depicted is immaterial, but there is advantage in selecting a scene which will permit a relatively large proportion of its surface to be luminescently treated to increase the reflecting characteristic of the shade. For artificial illumination fluorescent tubes **60**, **62**, **64**, and **66** preferably of the hot cathode type are supported in conventional manner within the jambs, mullion, and head of the window unit as best shown in Figures 1 and 3.

In order to increase the illumination from the tubes, the frame is fitted with reflectors (see Figure 3) as will now be described. Head **22** has bolted to it an upper reflector **76** adjacent tube **66**. Reflector **76** carries bosses **79** which serve as an abutment for the upper edge of a snapped-in reflector **78**; the lower edge of reflector **78** is provided with a turned-up edge **78***a* to fit over the flanged edge **22***a* of head **22**. A side reflector **70** (Figure 5) is bolted to jamb **24** adjacent tubes **60** and **64** and a snapped-in reflector **72** is shaped as shown so that one longitudinal edge **72***a* fits against bosses **73** formed on reflector **70** while the other longitudinal edge **72***b* is turned over to fit upon the flanged edge **24***b* of the jamb. A reflector **74**, shown in Figure 6, has two turned over edges **74***a* and **74***b* snapped over the inturned flanged portions **26***a* and **26***b* of million **26**. Thus the principal reflecting surfaces for the tubes **60**, **62**, **64** and **66** comprise the reflectors **78**, **74**, and **72**, which may be readily snapped into position or removed for cleaning or other purposes and yet are held securely in position when assembled.

In the embodiment illustrated in Figure 7, a reflector **80** has flanged edge portions **80***a* and **80***b* bolted to corresponding portions of mullion **81**. Lenses **82** are supported on each side of the tube **83** as by screws **84** and **85**; these lenses are designed to diffuse the light from the tube **82** evenly to afford a more uniform illumination. It will be apparent that similar lenses may be used with other lighting tubes of the structure shown if desired.

As shown in the lower portion of Figure 3, a space **87** is provided in sill **28** beneath sill plate **29**. This space may be used as a housing for the ballast tubes in the circuits of the hot cathode fluorescent lighting fixtures and such other electrical equipment as may be desirable in the operation of lighting tubes of this general type.

From the foregoing, it will be seen that constructions made in accordance with the present invention are well adapted to attain the ends and objects hereinbefore set forth, and to be economically manufactured, since the whole combination is suited to common production methods and is susceptible to a wide latitude of variations as may be desirable in adapting the invention to different applications.

As many possible embodiments may be made of the above invention and as many changes might be made in the embodiments above set forth, it is to be understood that all matter hereinbefore set forth or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

I claim:

1. In apparatus of the character described, the combination with a window shade of: a source of artificial light adjacent to margins of the shade and unobstructed with respect thereto, said shade being luminescently treated so as to cooperate with said light to give a general, indirect illumination.

2. In window construction, and in combination with a window unit including a head, jams and a sill: a shade mounted to be drawn over and to cover the window opening, and a source of direct light; said head, jambs and sill being in part hollow to act as housings for and to conceal direct view of the source of direct light, said source of direct light comprising fluorescently lighted tubing, said tubing being mounted within said housings and adjacent to and forwardly of the margins of the shade, said housings being provided with openings to admit light to shine upon the shade when extending therealong, and said shade being luminescently treated to act in cooperation with said source of direct light as a source of indirect, general illumination.

3. In a window unit, the combination with a double window shade of: a tape in extension of a margin thereof, said shade and tape together forming an endless assembly, a roller for supporting said assembly, assembly tensioning rolls, and a source of light; said tensioning rolls cooperating with said roller for tensioning said assembly, and one portion of the shade being luminescently treated so as to act in cooperation with said source of light as a source of indirect, general illumination.

4. In a window construction, and in combination with a window unit including a head, jambs and a sill: a double window shade and a tape-like portion together forming an endless assembly, a roller for supporting said assembly, a tape tensioning roll, and a source of light; said tape tensioning roll cooperating with said roller for tensioning said assembly, one portion of the shade being luminescently treated so as to act in cooperation with said source of light as a source of indirect, general illumination, and said head, jambs and sill being in part hollow to act as housings for the source of light.

5. In window shade apparatus of the character described and including a shade supporting roller, an endless tape and shade assembly and tape tensioning means, the combination with said apparatus of a double window shade; said shade extending upwardly over said roller and then reversely downwardly and being stretched by the tape, whereby a portion of the shade on either side of said roller may be pulled downwardly

with a portion of the shade on the other side of said roller going correspondingly upwardly, one portion of the double shade being treated with a luminescent material.

6. In apparatus of the character described, the combination with a window shade of: a source of artificial light adjacent to margins of the shade and unobstructed with respect thereto, said shade being luminescently treated so as to cooperate with said light to give a general indirect illumination, said source of light being positioned forwardly of the luminescently treated portions of the shade and being hidden from direct observation.

7. In apparatus of the character described, the combination with a window shade of: a source of artificial light adjacent to margins of the shade and unobstructed with respect thereto, said shade being luminescently treated so as to cooperate with said light to give a general indirect illumination, said source of light extending around portions of each of three sides of the shade.

LINDSLEY SCHEPMOES.