

July 27, 1965

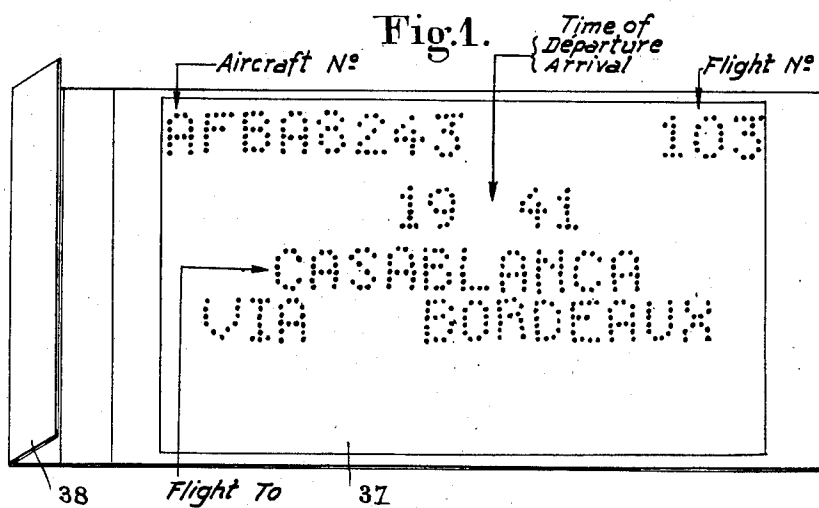
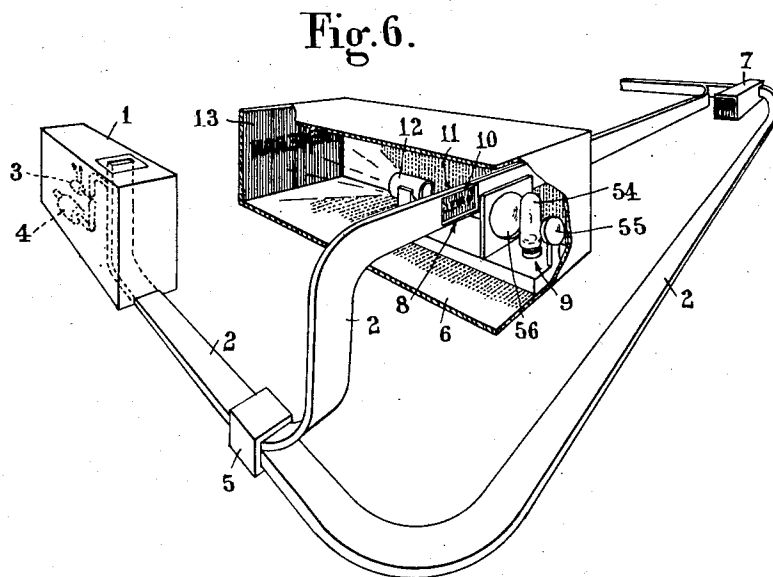
J. GOUYOU-BEAUCHAMP ETAL

3,196,740

REMOTE-CONTROLLED LUMINOUS DISPLAY PANEL SYSTEM

Filed Nov. 29, 1960

4 Sheets-Sheet 1



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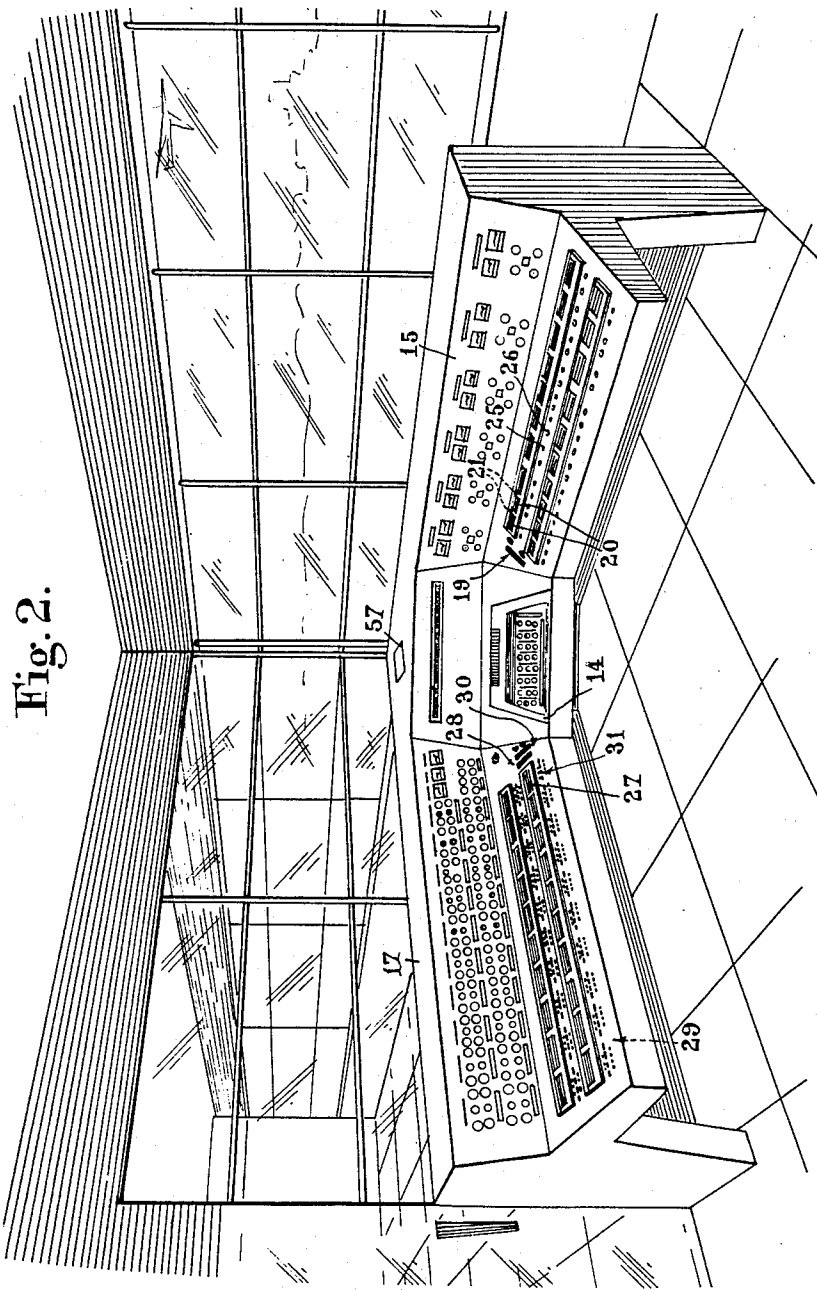
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REMOTE-CONTROLLED LUMINOUS DISPLAY PANEL SYSTEM

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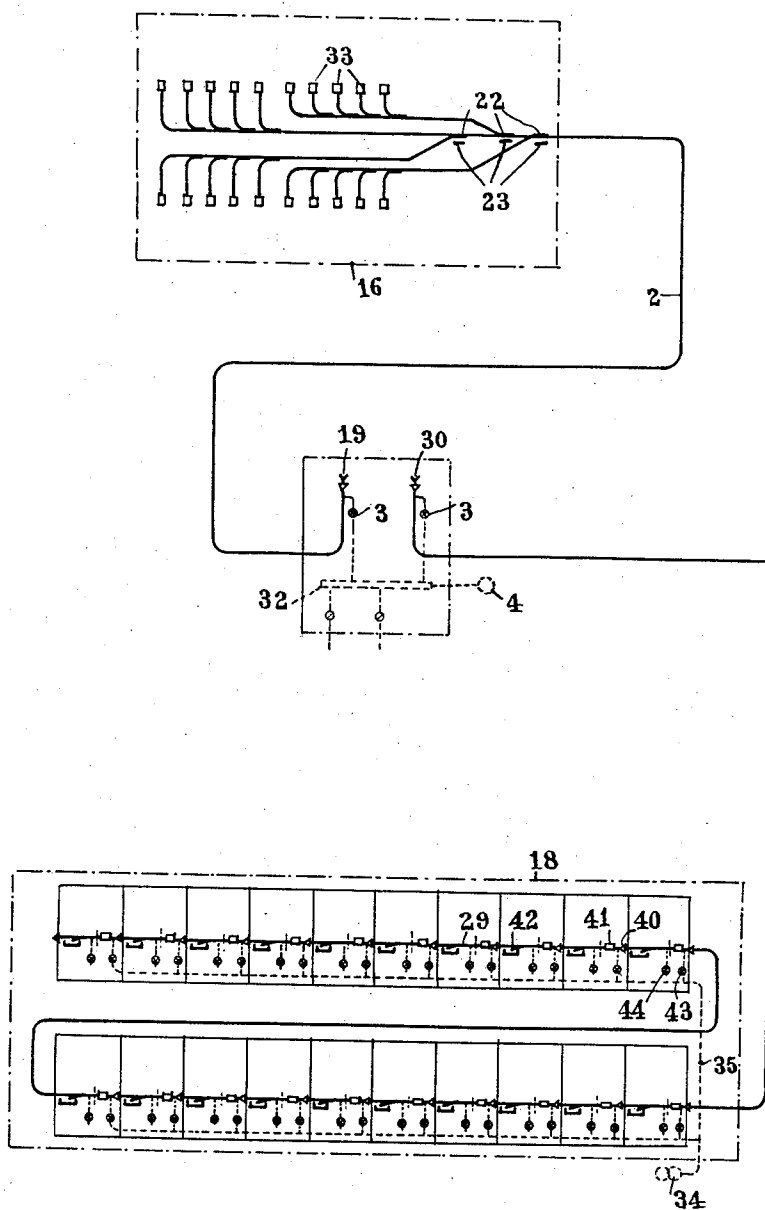
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REMOTE-CONTROLLED LUMINOUS DISPLAY PANEL SYSTEM

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Fig.3.



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REMOTE-CONTROLLED LUMINOUS DISPLAY PANEL SYSTEM

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Fig. 4.

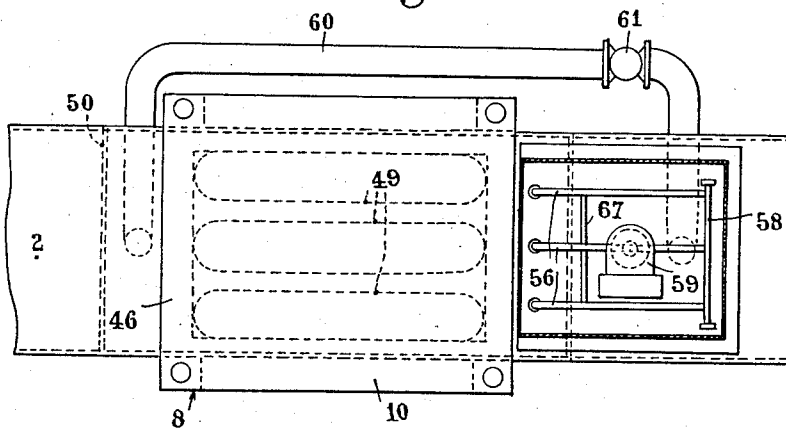
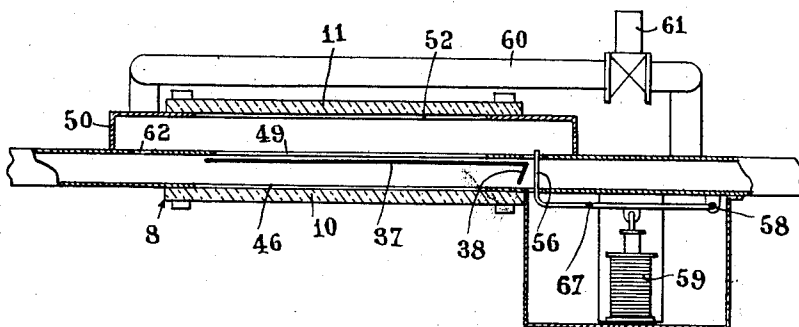


Fig. 5.



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3,196,740 REMOTE-CONTROLLED LUMINOUS DISPLAY PANEL SYSTEM

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Patent 1,252,070

7 Claims. (Cl. 88—28)

It is frequently necessary in many fields to compose a text at one control place and to have it read at other places by a large number of persons. Thus, typical applications of this technique are the displaying of departure times in railway stations and airports, the transmission of processing orders in large works (for example in rolling mills and the like), etc. Different types of luminous remote-controlled display panels are already known, such as those used for luminous clocks of the type displaying numerals, or the devices used for calling persons separately to reception counters.

An inconvenience common to all these devices is that they require an extremely complicated electrical control circuitry when it is contemplated to compose from a distance texts comprising a great number of characters.

On the other hand, the display panel itself must consist of unitary elements of which the number becomes extremely high (at the rate of one element per character to be displayed). These two inconveniences result in a very complicated control board or desk, whether each character is controlled separately or by using intermediate electronic coders or decoders.

It is the essential object of this invention to provide a method of displaying luminous texts from a distance which consists broadly in utilizing cards carrying the inscriptions to be projected, and transferring these cards pneumatically to projectors associated with display panels.

These cards may be discharged or transferred from one panel to another, or from one compartment of a panel or board to another compartment in the same panel or board, if the text or signs is or are to be displayed successively at several locations.

The starting and the directional switching of each display card to be projected from the control desk may be controlled by introducing a pilot-card into a suitable card-carrier, the projected display card being deleted by removing this pilot card.

The transfer of the display card to the successive compartments of a display panel may be controlled by causing the pilot card to slip in synchronism into the successive compartments of a synoptic board.

The apparatus for carrying out the method of this invention comprises essentially a synoptic control board or desk, pneumatic pipe lines connecting this desk to the display panels, a lantern-slide carrier comprising means for automatically positioning the card to be projected onto the screen, and electrical means for controlling on the one hand the valves delivering compressed air to the tubes of the network and on the other hand the switches and other devices for placing the cards in their transfer or discharge positions in the slide carriers, other electrical means being provided for switching the projection lamps on and off.

In order to afford a clearer understanding of this invention and of the manner in which the same may be carried out in practice, reference will now be made to a typical form of embodiment of a remote-controlled luminous display panel constructed according to the teachings of this invention and shown in the accompanying drawings by way of example. In the drawings:

FIGURE 1 is a perspective view of a card.

FIGURE 2 is a perspective view of the control desk.

FIGURE 3 is a diagram of the pneumatic tube network.

FIGURES 4 and 5 are an elevational view and a sectional view respectively of a lantern-slide carrier; and

FIGURE 6 is a perspective fragmentary view showing a typical installation constructed according to this invention.

The text to be projected, which consists of letters, numerals or signs, is punched or printed in a transparent or opaque card of any suitable material, the size of the card being consistent with the inner dimensions of the conveyor tubes.

This card 37 is folded at its front end (in the direction of movement of the card in the pneumatic lines) to provide a flap or lug 38 of a well-defined length according to the method already known per se for conveying messages in flat-sectioned tubes or pipe lines 2.

The arrangement further comprises a control desk (see FIG. 2), a network pneumatic conveyor tubes (see FIG. 3) and display panels for example of the type illustrated in FIG. 6.

The method of operation of the apparatus will now be described with reference more particularly to FIG. 6.

Each display card carrying the desired text is introduced into a pressure-operated dispatcher 1 connected to a flat-sectioned tube 2 of known type. The delivery of cards is controlled at the desired moments by actuating the conventional means controlling a solenoid-operated valve 3 supplying compressed air to the line; a blower 4 feeds compressed air from the rear of the card 37 and as this air impinges against the flap 38 it drives the card 37 along the tube 2. This tube 2 may comprise switching means 5 to permit the delivery of cards to either of a pair of projectors 6 and 7. This card 37 is stopped and positioned in a lantern-slide carrier 8 by a device to be described presently.

Mounted behind the carrier 8 is a projection assembly 9 comprising a lamp 54, a reflector 55 and a condenser 56. The lantern-slide carrier is provided with a pair of transparent windows 10, 11 formed in the tube walls; the light rays are focused by an optical system 12 and projected onto a display screen 13 of adequate dimensions.

FIGURE 2 illustrates by way of example a control desk. In its central portion this desk comprises an operator's board comprising a conventional typewriter keyboard 14 adapted to either perforate the cards according to the known method used in the manufacture of printing plates for addressing machines, or print characters directly on the cards if they are transparent.

On either side of this operator's board are two desk portions corresponding the one (15) to a display panel 16 (FIG. 3) divided into compartments in which the inscriptions are stationary, that is, deleted after the projection without being re-displaced in the next compartment, and the other (17) to a board 18 wherein the inscriptions are movable, that is, always introduced into the first compartment of the board and then transferred successively to the other compartments of the board so as to successively occupy all the compartments up to the last one, as one of the signals existing in one of these compartments is deleted, so that the inscriptions remain constantly arranged in the same order as that in which they were introduced.

In the case of a board comprising stationary inscriptions 15 the operation is as follows:

A display card 37 (shown lying on the desk in the figure) is introduced into the slot 19 of a pressure-operated transmitter of known type. Simultaneously with the card to be transmitted to the display panels, a perforated pilot card 57 is placed in any one of the card carriers 20 (provided that it is empty).

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When a card is introduced into one of the card carriers 20, a contact 21 mounted therein is actuated and controls the corresponding switch 22 in the tube network. An auxiliary contact of this switch 23 opens an air control solenoid valve 3 in the pneumatic transmitter and thus the display card is driven along the tube. When this card has attained the desired display panel, a limit switch 24 is actuated and restores the tube switch to its inoperative position, the air control solenoid valve 3 is re-closed and the lamp of the projection lantern energized. Then another card may be delivered to another compartment (see FIG. 3).

When it is desired to delete the sign or text thus transmitted, the corresponding pilot card is removed from the card carrier 20, and as the electric contact 21 is released it controls the display card ejection (as will be described presently in connection with the description of the lantern-slide carrier).

Two pilot lamps, a green lamp 25 and a red lamp 26 are disposed in front of each card carrier 20 so that the operator may easily check, according to the color of the lighted lamp, whether the relevant compartment contains a card or not. Thus, it is possible to see at any time the inscription or signal projected in each compartment of the general control desk.

The movable inscription board operates as follows:

The pilot card 57 similar to the one already mentioned hereinabove can only be introduced into the first compartment 27 through the slot 28. A mechanical conveyor 29 is provided for transferring the pilot card from one compartment to the next compartment when the latter is free.

When the operator wants to display an inscription in a free compartment (which is always the first compartment of the control board) he or she introduces the display card 37 into the slot 30 of the transmitter and the pilot card 57 into the slot 28. As the pilot card reaches its position in the first card carrier 27 it actuates a contact or limit switch 31 controlling the starting of the display card toward its display position.

Thus, a synoptic table representing the exact pattern of the general board is obtained.

FIG. 3 shows the general diagram of the pneumatic pipe-line network incorporating a blower 4 delivering compressed air to a manifold 32, a pair of solenoid valves 3 controlling the distribution of compressed air to the two lines of flat tubes, the two transmitters 19 and 30 and the two tubular circuits 2 leading the one to a fixed panel 16 and the other to a movable panel 18.

The panel 16 for stationary display comprises tube switches 22 and lantern-slide carriers 33. The movable panel 18 comprises an auxiliary blower 34 delivering air under pressure to a manifold 35. Each compartment of the board comprises a non-return valve 40, a lantern-slide carrier 41, an ejector switch 42, an inlet solenoid valve 43 and an outlet solenoid valve 44.

To deliver the card to the first compartment, the operator closes the inlet valve 43 and opens the outlet valve 44, and thus the card is positioned automatically in the first lantern-slide carrier. To transfer the card from one compartment to the next compartment the inlet valve of the first compartment is opened and the inlet valve of the adjacent compartment is closed. Thus, a draught is created between the inlet valve of the first compartment and the outlet valve of the second compartment, this being sufficient for transferring the card from one compartment to the other. Under these conditions it is a simple matter to modify the complete board by displacing each card from one compartment to another. Moreover, a card located in anyone of these compartments may be ejected into a basket; to this end, the inlet valve of the compartment is opened, the outlet valve closed and the switch 42 positioned to deflect the path of the card; these different operations are obtained by simply

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removing the corresponding pilot card 57 from its compartment in the synoptic board. The fact of freeing a compartment by ejecting a card therefrom entrains automatically the movement of the cards from the preceding compartments.

A typical form of embodiment of a lantern-slide carrier will now be described with reference to FIGS. 4 and 5 of the drawings. In this device the standard tube 2 is formed with registering apertures in its two larger sides, that is, a larger aperture 46 on one side, which is covered and sealed by a transparent plate 10 of glass or plastic, and a grid-like aperture 49 on the other side. Welded on the tube in front of this grid-like aperture 49 is a box-shaped body 50 formed with a front aperture 52 registering with the grid 49, this aperture 52 being covered and sealed by a transparent plate 11 of glass or plastic grid 49.

Following these apertures 46, 49 (in the direction of travel of the cards) is a comb-like device consisting of a plurality of parallel metal hooks 56 rigidly assembled by means of a bracing member 67 and pivotally mounted on a vertical hinge pin 58, these hooks being adapted to either stop the movement of the cards in the tubes or retract completely therefrom under the control of an electromagnet 59.

The box 50 communicates through a duct 60 with the tube section located after the card-stopping comb 56 (in the direction of travel of the cards), this duct 60 being controlled by a solenoid-operated valve 61.

This assembly operates as follows: when the card is to be stopped for projection purposes in the lantern-slide carrier, the comb 56 is left in its card-stopping position, that is, with its control electromagnet de-energized, and the card driven by the draught is pressed against the comb teeth so that the flap 38 acts as a shutter closing almost completely the inner tube path and thus creates a loss of pressure between the tube sections located before and after the comb 56, respectively.

As the solenoid-operated valve 61 is open, the box is at the same pressure as the tube section following the comb 56; therefore, a pressure differential is established on either side of the card flap 38 which will press the card against the comb 56 so as to accurately position the card in relation to the condenser and other optical components of the projection system 9.

When it is desired to remove or delete the signal or text carried by this card, the operator controls through any suitable means the valve 61 while energizing the electromagnet 59 to retract the hooks of the stopping comb from the inner path of the tube 2. As the valve 61 is closed, the chamber in box 50 will be at the same pressure as the tube section preceding it, due to the leakage produced through the hole 62.

As the card is no more pressed against the comb hooks 56 it will be easily released by the air draught. According to cases, it may be either evacuated into a suitable container or transferred to another compartment if it is to be displayed again.

Although the present invention has been described in conjunction with a preferred embodiment, it is to be understood that modifications and variations may be resorted to without departing from the spirit and scope of the invention, as those skilled in the art will readily understand. Such modifications and variations are considered to be within the purview and scope of the invention and appended claims.

What we claim is:

1. An installation for the remote-controlled luminous display on display panels of inscriptions carried by cards, which comprises a central control station incorporating a synoptic control board, flat-sectioned pneumatic tubes forming a circuit connecting said control board with said display panels, valves controlling a supply of compressed air to said tubes, diverting switching means in said circuit

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for diverting cards to selected display panels, each display panel comprising a screen, a lantern-slide carrier incorporating means for automatically positioning and ejecting the card to be projected onto said screen, a projector associated with said lantern-slide carrier and having a projection lamp, and electrical means for operating said valves, said diverting switching means and the means for positioning and ejecting the cards in and from said lantern-slide carrier, and also for switching on or off the projection lamp of said projector.

2. An installation as set forth in claim 1, in which said lantern-slide carrier comprises one section of said flat-sectioned pneumatic tube circuit apertured on its two major sides to provide on one side an opening corresponding in size to said cards and closed by a first transparent wall and to provide on the other side an opening of like size in which a grid is positioned and which opens into a box having another transparent wall opposite said first transparent wall, a stop movable into and out from said lantern-slide carrier for stopping the movement of a card in said tube section and subsequently releasing said card under remote-control electrical means.

3. An installation as set forth in claim 2, wherein said box communicates through the medium of an electromagnetic valve with the downstream portion of said pneumatic tube so as to produce in said box a reduced pressure by which the card is urged against the aforesaid grid of the lantern-slide carrier.

4. An installation for remote-controlled luminous display of indicia on display panels, comprising a central station, a plurality of remote display stations, an optical projector at each of said display stations, flat-sectioned pneumatic tubes arranged in a circuit connecting said central station with each of said display stations, a plurality of display cards each carrying indicia to be displayed and of a size and shape to pass through said tubes, means for inserting one of said display cards in said pneumatic tube circuit at said central station, means for applying an air pressure differential to transport said card through said tube circuit, means controlled from said central station for directing said card to a selected one of said display

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stations, means located at each of said display stations and controlled from said central station for positioning said card in accurate position for display by said projector, and means located at each of said display stations and controlled from said central station for release of a display card for return to said central station.

5. An installation according to claim 4, further comprising a plurality of pilot cards each corresponding to a display card and a plurality of receptacles for said pilot cards at said central station each corresponding to a display station and in which said control means comprises card sensing means at each of said receptacles for sensing pilot cards placed in said receptacles to control the routing, positioning and subsequent release of the corresponding display cards.

6. An installation according to claim 4, in which said card positioning means at each display station comprises an apertured wall in said tube at said display station and means for applying a differential air pressure for pressing said display card against said apertured wall.

7. An installation according to claim 6, further comprising means for relieving said differential air pressure pressing said card against said wall when said card is released for return to said central station.

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