

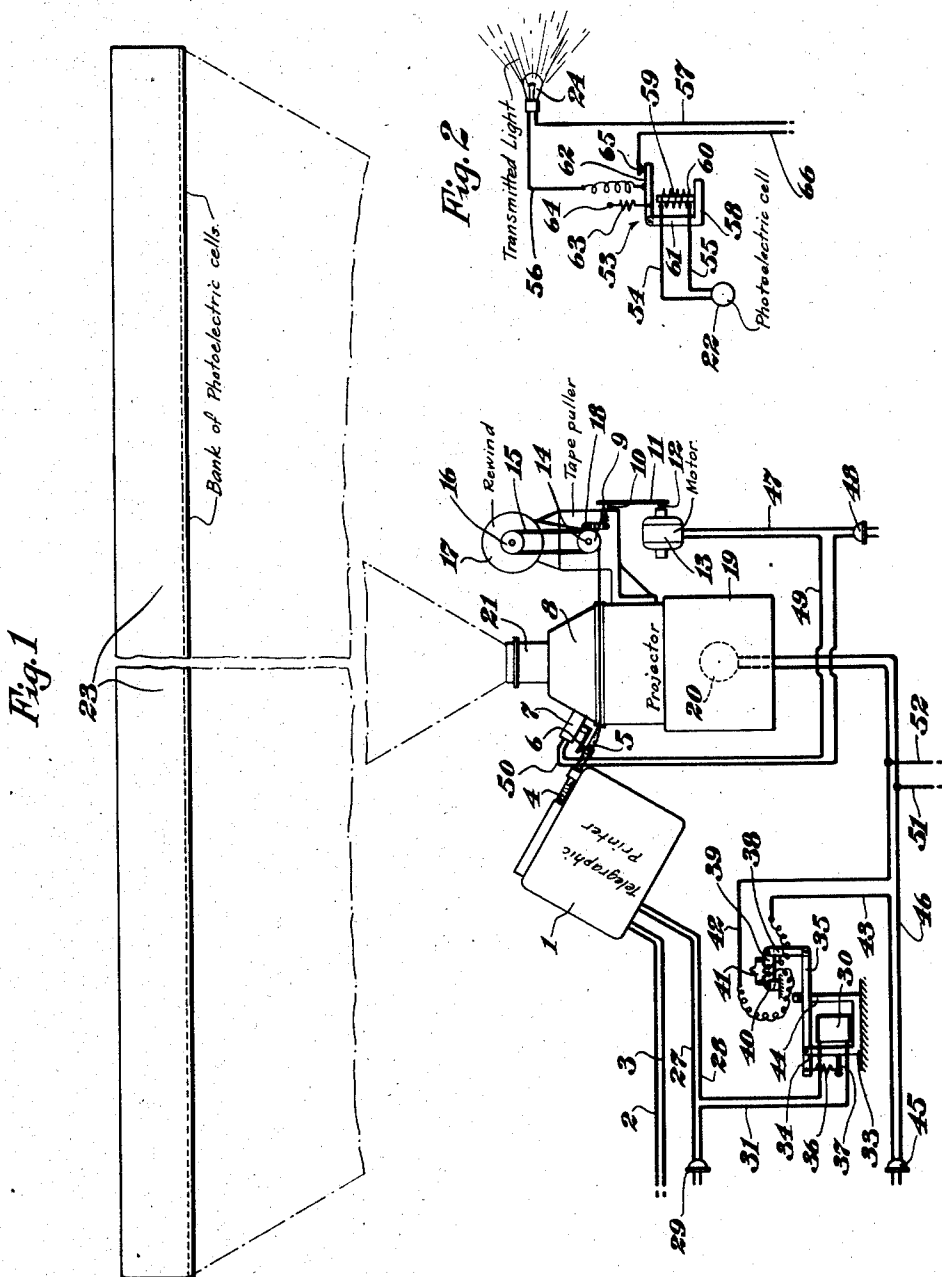
Feb. 28, 1939.

A. D. EITZEN

2,148,450

MESSAGE TRANSMITTING PROJECTING SYSTEM

Original Filed Aug. 28, 1933 3 Sheets-Sheet 1



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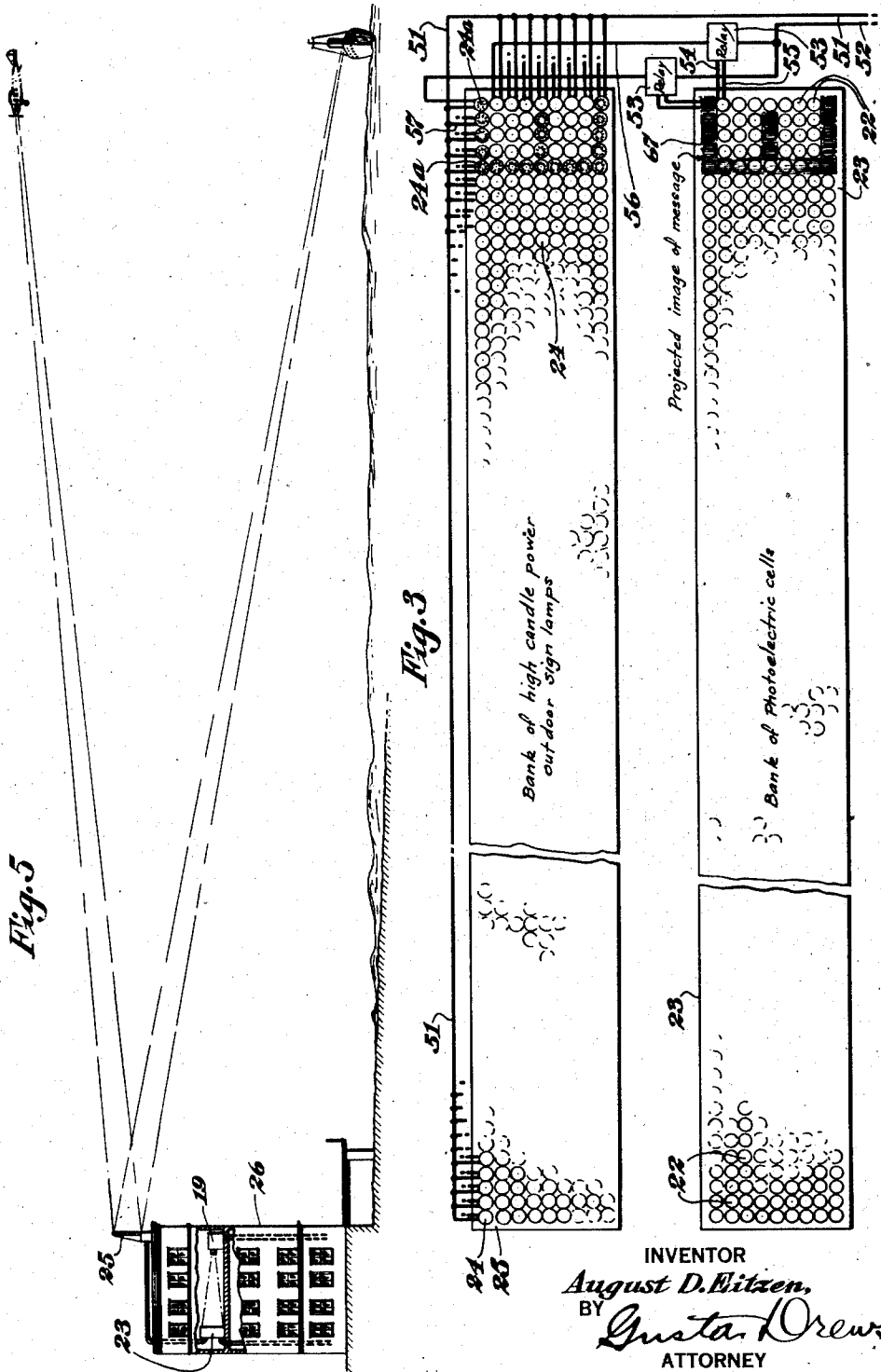
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3 Sheets-Sheet 2



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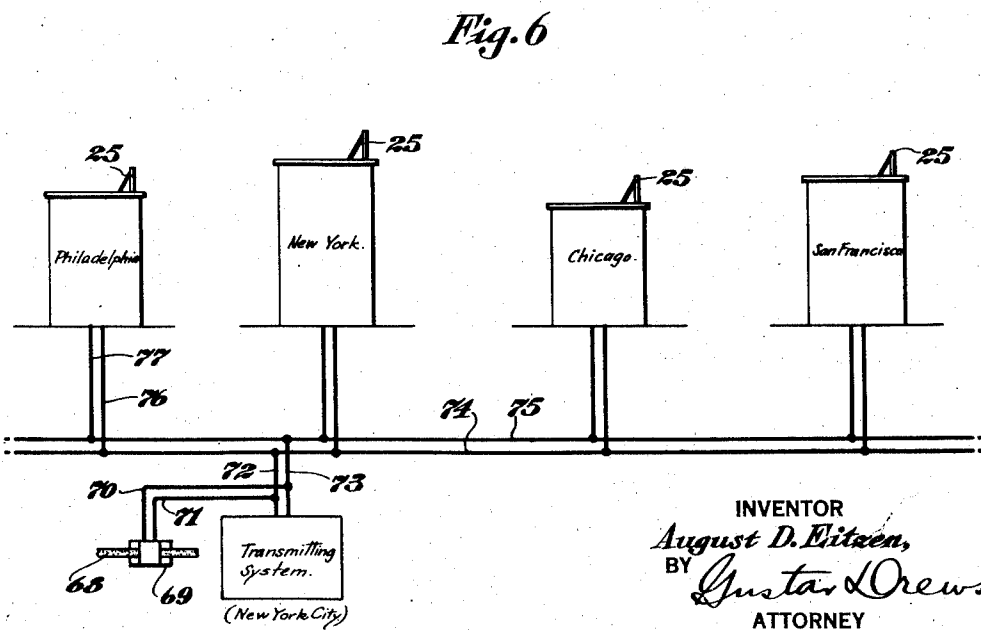
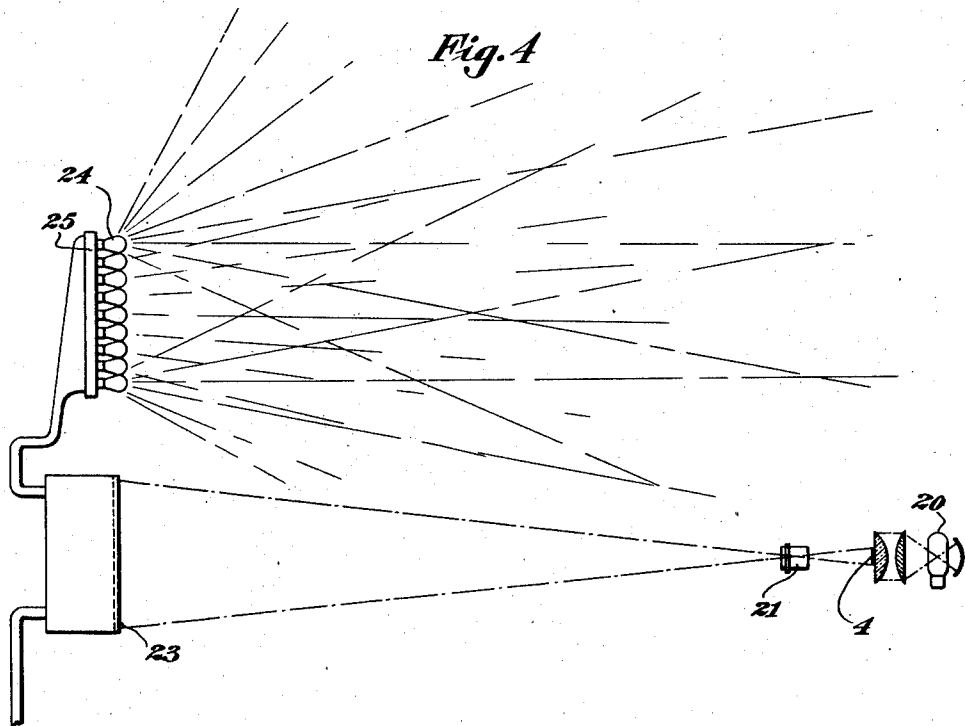
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MESSAGE TRANSMITTING PROJECTING SYSTEM

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Refiled for abandoned application Serial No. 687,031, August 28, 1933. This application May 20, 1938, Serial No. 209,041

4 Claims. (Cl. 177-350)

This application is a refile of abandoned application 687,031, filed Aug. 28, 1933.

This invention relates to message transmitting projecting systems in general and more especially to systems for transmitting printed messages by projection or the like and to the devices associated with such systems.

Among the objects of the present invention, it is aimed to transmit a printed message by a projector including an illuminated sign controlled by a projector associated with a printed tape.

It is still another object of the present invention to provide an improved illuminated sign associated with a light sensitive control device.

It is still another object of the present invention to provide an improved illuminated sign controlled by a light sensitive device in turn controlled by the light rays interrupted by the printed characters on a transparent or translucent tape.

It is still further an object of the present invention to provide an improved combination including a telegraphic printer printing tape by which messages are printed on a translucent or transparent ribbon tape, a light sensitive device, a projector for transmitting light rays through the tape unobstructed by printed characters, and an illuminated sign controlled by said light sensitive device to form an illuminated message corresponding to the printed message on the tape.

These and other features, capabilities and advantages of the invention will appear from the subjoined detail description of one specific embodiment thereof illustrated in the accompanying drawings in which

Figure 1 is a wiring diagram associated with a telegraphic printer, a projector, a tape puller and a light sensitive device made according to the present invention;

Fig. 2 is a wiring diagram of the photo-electric cell and light bulb constituting one unit of a part of the present invention;

Fig. 3 is a diagram of a bank of lamp bulbs and a bank of photo-electric cells and their connecting wires;

Fig. 4 is a diagrammatic end elevation of the bank of lamp bulbs and bank of photo-electric cells shown in Fig. 3 in association with an optical system;

Fig. 5 is an end elevation of the illuminated sign mounted on the top of a building in relation to a boat and an aeroplane remotely disposed therefrom; and

Fig. 6 is a diagram showing a plurality of signs

at different receiving stations associated with a single transmitting station.

In the embodiment shown, there is illustrated a telegraphic printer 1 constituting a part of a receiving station connected to a transmitting station by the usual main leads 2 and 3. The printer is of the type extensively used for printing characters on narrow tape, such as the ribbon tape 4. With stock quotation projecting machines, there are as a rule two rows of printed matter formed to read longitudinally of the tape 4. With the ordinary interoffice communicating telegraph machines on the other hand the printers as a rule print only a single longitudinally readable row of printed matter. In the present instance, the invention is illustrated as associated with a printer which prints a single row of longitudinally readable printed matter.

The tape 4 in the present instance, passes under the roller or finger 5 of a lever 6 associated with an electric switch mounted in the housing 7 extending from the extension 8. The extension 8 is provided with a vertically extending light aperture through which the tape 4 passes to the tape pulling roller 9.

The tape pulling roller 9 in the present instance is connected by a suitable reduction gearing with the shaft 10 provided with a gear or sheave connected by the belt or sprocket chain 11 with a gear or sheave mounted on the shaft 12 of the motor 13.

The shaft 14 on which the tape pulling roller 9 is mounted is further provided with a sheave which is connected by the belt 15 with the sheave 16 of a rewind reel 17, the tape 4 in the present instance maintained in frictional driving engagement with the tape puller 9 by the spring pressed idler 18. From the tape puller 9, the tape 4 passes up to the rewind reel 17.

The extension 8 is formed in the lamp housing 19 in which the lamp 20 is mounted which directs the light rays through the tape 4 preferably composed of some suitable translucent or transparent material, such as glassine paper or Cellophane and from there passes to the objective lens unit mounted in the casing 21. From the objective lens unit mounted in the casing 21, the light rays are directed onto a light sensitive device in the present instance consisting of a bank of photo-electric cells 22 mounted in the casing 23. This bank of electric cells should of course be proportional in dimensions to the light aperture. When a standard tape of the telegraphic printer machine is used of about three-eighths of an inch in width and the length of the light aperture is

about five inches, the light aperture will obviously be about three-eighths of an inch in width by five inches in length or in the proportions of three to forty.

5 With a light aperture of this size, if the bank of photo-electric cells has nine cells as indicated in Fig. 3, transverse of the same there should be about one hundred and twenty cells to the length, that is in the proportions of three to forty. There are of course photo-electric cells of various dimensions in use today.

10 Excellent results have been obtained when the photo-electric cells are about two and one-half inches in diameter. For each light sensitive device or bank of photo-electric cells, there is provided an illuminated sign of transmitted light consisting of a plurality of electric lamp bulbs 24 in the present instance mounted in the casing 25. In accordance with the present instance, there preferably is one electric light bulb for each photo-electric cell. In other words, for the bank of photo-electric cells illustrated in Fig. 3, there should be one or more banks of electric light bulbs each having nine electric light bulbs extending transversely of the housing 25 and one hundred and twenty light bulbs extending longitudinally of the same.

15 The transmitting system associated with the leads 2 and 3 may of course be remotely disposed relative to the receiving stations. At the receiving stations, the telegraphic printer 1 and a bank of photo-electric cells 22 may be located inside of a building, such as the building 26 illustrated in Fig. 5 and the casing 25 for the illuminated sign on the top of the building.

20 In the present instance for controlling the lamp 20 of the projector, the motor 13 and the electric circuit for the lamp bulbs 24, the wiring system now to be described is provided as illustrating one method of electrically connecting these several parts.

25 The telegraphic printer 1 is provided with two main leads 27 and 28, the lead 27 being connected to the outlet plug 29, and the lead 28 connected to the winding of the magnet 30 which in turn is connected by the lead 31 with the outlet plug 29. This outlet plug is connected to a source of current supply by the attendant at the particular receiving station when it is desired to pick up messages transmitted by the transmitting station over the leads 2 and 3.

30 The magnet 30 in the present instance is mounted upon a bracket 33 having an upright 34 to which is pivotally connected the lever 35, the short arm of which is connected by the spring 36 with the abutment 37 and the long arm of which is connected by the link 38 with the arm 39 pivotally connected to the abutment 40. The arm 39 has preferably mounted thereon a fluid mercury container 41 provided with two contacts to constitute a switch, one of which contacts is connected to the lead 42 and the other to the lead 43.

35 The bracket 33 preferably is also provided with a second upright 44 having a stop projection at its upper end to limit the upward movement of the long arm of the lever 35. The lead 43 is preferably connected to the outlet plug 45 and the lead 42 to the lamp 20. The other lead for the lamp 20, being the lead 46 is also connected to the outlet plug 45.

40 By means of the wiring so far described, it will be obvious that the printer 1 will be ready to be operated when the outlet plug 29 is connected to a source of supply and the lamp 20 will be ready

to be illuminated when the plug 45 is connected to a source of electric supply.

It will also appear that when a message is transmitted over the wires 2, 3 to the printer 1, the printer will in turn close the circuit for the magnet 30 as shown for instance in Fig. 1 of my Patent No. 1,908,333 issued May 9, 1933, thereby to attract the long arm of the lever 35 constituting an armature against the tension of the spring 36 in turn to rock the switch 41 into circuit making position in which the circuit for the lamp 20 will be closed to illuminate the lamp 20. The motor 13 is connected as illustrated by one lead 47 with the outlet plug 48 and by another lead 49 with one of the contacts of the switch contained in the housing 7. The other contact of the switch contained in the housing 7 is connected by the lead 50 with the outlet plug 48.

45 From the foregoing, it will then follow that when a message is transmitted to actuate the printer 1, it will not only close the circuit for the magnet 30 but also print and discharge tape 4, which tape in turn will initially form a loop under the roller 5 of the lever 6 thereby to close the switch contained in the housing 7, to close the circuit for the motor 13 whereupon the motor 13 will operate to actuate the tape puller 9 to draw the tape across the light aperture of the extension 8.

50 The circuit for the lamp 20 is preferably also connected in parallel with the circuit of the lamps 24 mounted in the casing 25. In the present instance, the lead 46 is connected to the common lead 51 of the lamps 24 and the lead 42 is connected to the main lead 52 of the relays 53 of the photo-electric cells 22. There is provided an individual relay system 53 for each photo-electric cell connected by a pair of leads 54 and 55. Each relay system 53 is in turn connected by a lead 56 with one of the lamps 24. Each of the lamps 24 in turn is connected by a lead 57 with the main lead 51.

55 The relay 53, see Fig. 2, consists essentially of a bracket 58 on which the core 59 of a magnet is mounted to receive the winding 60 connected with the leads 54 and 55 of a photo-electric cell 22. Pivotally connected to the upright 61 of the bracket 58, there is provided the arm 62 constituting an armature which is normally maintained in raised position by the spring 63 connected to a suitable abutment 64.

60 The lever 62 not only constitutes an armature but also a conductor having one end thereof formed into a contact to cooperate with the contact 65 of the lead 66 connected to the main lead 52. The arm 62 is furthermore connected by the lead 56 to a lamp 24 and the lamp 24 as aforesaid is connected by the lead 57 with the main lead 51.

65 As aforesaid, the bank of photo-electric cells 22 is preferably mounted in a housing 23 positioned to receive the light rays from the aperture of the extension 8.

70 Furthermore, the photo-electric cells 22 are of the type which are sensitive to light rays so that the current of each cell 22 set up by the same, in the present instance energizes a winding 60 when the light rays pass to such cell.

In the present instance, the printed markings on the tape are used to interrupt the passage of the light rays from the lamp 20 to the cells 22. In other words, the tape 4 passing across the light aperture of the extension 8 will intercept all of the light rays directed at such light aperture by the lamp 20. The tape 4 consisting of a transparent or translucent material will permit the light

rays to pass through the same onto the cells 22 except when the tape is marked by printed matter.

It is of course understood that the ink selected for the printer when transferred onto the tape will constitute a light interrupting device. In this way, as the tape 4 with its printed characters passes across the light aperture of the extension 8, it will allow certain light rays to pass there-through onto the cells 22 and interrupt other light rays corresponding to the characters or markings on the tape.

If the marking on the tape happens to be the letter "E", see the darkened portion 67 at the right hand end of the housing 23, it will interrupt the light rays to a group of cells 22 corresponding to the section of the letter "E" as indicated by the darkened portion 67 and thereby interrupt the excitation of such cells 22 when the armatures 62 associated with such cells will be urged by the springs 63 to engage the contacts 65 in turn to close the circuits for a group of lamps, see the lamps 24^a corresponding in position to reproduce the outline of the letter "E". In this way, a moving message consisting of illuminated letters may be formed by the lamps 24 corresponding to the message printed on the tape 4. It will also appear from the foregoing that by this system, a message can be broadcast by an illuminated sign from a remote sending station.

The sending station or transmitting system may have an endless tape on which the master is impressed or may have any other suitable means, such for instance as a perforated tape 68 cooperating with a tape transmitter 69 connected by the electric conductors 70 and 71 with the main leads 72 and 73 of the transmitting system, which main leads 72 and 73 in turn may be connected to the main carrying leads 74 and 75 respectively which in turn may be connected to a number of receiving stations located in widely scattered places, such as Philadelphia, New York, Chicago and San Francisco as indicated in Fig. 6, the receiving stations at such locations being connected with the main leads 74 and 75 by the electric conductors 76 and 77 respectively by well known telegraphic methods or by radio broadcast.

The value of such illuminated signs is of course obvious since a message can thus be transmitted or broadcast to a noisy crowd or at great distances removed from the receiving station, as for instance to vessels out at sea or aeroplanes as indicated in Fig. 5.

From the foregoing, it will thus appear that when a message is transmitted to a printer 1, the printer in turn will reproduce a master of the message so printed, in the present instance, by producing printed characters on the tape and this master will then be drawn across the light aperture interposed between a source of light, such as the lamp 20 and a light sensitive mechanism, such as the bank of photo-electric cells 22 to silhouette, project or the like an image or images of the printed characters on the tape onto said light sensitive mechanism. The current of the silhouetted cells will become interrupted in turn to permit the armatures 62 of the electric lights 24 connected thereto to establish the current of such connected lamps and the current of all of the remaining cells 22 receiving light from the source of light 20 will be established to attract the armatures 62 of the lights 24 connected therewith and thereby the current to such lights in turn interrupted.

It will of course also be obvious from the foregoing that a dark room may or may not be used according to the character of the light rays directed by the source of light and the character of the light sensitive mechanism, and according to the position of the respective parts, so long as control of the light rays to the light sensitive mechanism can be effectively performed by the markings on a tape or by any other suitable light interrupting device.

It is obvious that various changes and modifications may be made to the details of construction of the apparatus used and to the details of the system without departing from the general spirit of the invention as set forth in the appended claims.

I claim:

1. In a message transmitting system, the combination with a bank of electric lights included in normally closed circuits; of a light sensitive mechanism including a plurality of light sensitive units for interrupting the current to such of said electric lights which form a dark background for the message defining light symbol or symbols; and means for energizing the units in said light sensitive mechanism corresponding to the dark background of the message to be formed consisting of a source of light, means including a light transmitting tape, a printer for printing light interrupting characters on said tape, a light aperture interposed between said source of light and said light sensitive mechanism, means for drawing the tape across said light aperture as it is discharged by said printer to silhouette images of the printed matter on the tape onto said light sensitive mechanism, means including a switch for establishing the electric circuit of said source of light and for setting preparatory to establishing the electric circuits of said bank of electric lights whereby the bank of lights will be dark when the printer is at rest, and means including a relay operatively associated with said printer for closing said switch when the message is transmitted to said printer.

2. In a message transmitting system, the combination with a plurality of electric lamp circuits, each electric lamp circuit including a secondary electric switch and an electric lamp, said electric lamps being positioned to form a compact bank, of a plurality of light sensitive circuits, each light sensitive circuit associated with one of said electric lamp circuits and including a light sensitive unit and a secondary relay controlling the secondary switch of its associated lamp circuit, an electric circuit including a source of light for energizing said light sensitive units, a printer including a light transmitting tape and operable to print light interrupting characters on said tape and discharge the same to pass between said light source and said light sensitive units, means including a main electric switch for establishing the electric circuit of said source of light and for preparing the electric circuits of said electric lamps to be established or interrupted by said light sensitive units, and means including a main relay operatively associated with said printer for closing said main electric switch when a message is transmitted to said printer whereby the printer not only controls the electric circuit of said source of light and the electric circuits of the lamps of said bank of electric lamps but also through its tape controls the circuits of said light sensitive units and thereby the ultimate message to be formed by said bank of electric lamps.

3. In a message transmitting system, the com-

bination with a plurality of electric lamp circuits,
 each electric lamp circuit including an electric
 lamp, of a plurality of light sensitive circuits,
 each light sensitive circuit associated with one of
 5 said electric lamp circuits and including a light
 sensitive unit controlling its associated lamp cir-
 cuit, an electric circuit including a source of light
 for energizing said light sensitive units, a printer
 including a light transmitting tape and operable
 10 to print light interrupting characters on said tape
 and discharge the same to pass between said light
 source and said light sensitive units, means in-
 cluding a main electric switch for establishing the
 electric circuit of said source of light and for
 15 preparing the electric circuits of said electric
 lamps to be established or interrupted by said
 light sensitive units, and means including a main
 control relay operatively associated with said
 printer for closing said main electric switch when
 20 a message is transmitted to said printer whereby
 the printer not only controls the electric circuit
 of said source of light and the electric circuits of
 the lamps of said bank of electric lamps but also
 through its tape controls the circuits of said light
 25 sensitive units and thereby the ultimate message
 to be formed by said bank of electric lamps.

4. In a message transmitting system, the com-

bination with a plurality of electric lamp circuits,
 each electric lamp circuit including an electric
 lamp, of a plurality of light sensitive circuits,
 each light sensitive circuit associated with one
 5 of said electric lamp circuits and including a light
 sensitive unit controlling its associated lamp cir-
 cuit, an electric circuit including a source of light
 for energizing said light sensitive units, a printer
 including a light transmitting tape and operable
 10 to print light interrupting characters on said tape
 and discharge the same to pass between said light
 source and said light sensitive units, means in-
 cluding a main electric switch for establishing the
 electric circuit of said source of light and for pre-
 15 paring the electric circuits of said electric lamps
 to be established or interrupted by said light
 sensitive units, and means operatively associated
 with said printer for closing said main electric
 switch when a message is transmitted to said
 printer whereby the printer not only controls the
 20 electric circuit of said source of light and the
 electric circuits of the lamps of said bank of elec-
 tric lamps but also through its tape controls the
 circuits of said light sensitive units and thereby
 the ultimate message to be formed by said bank
 25 of electric lamps.

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