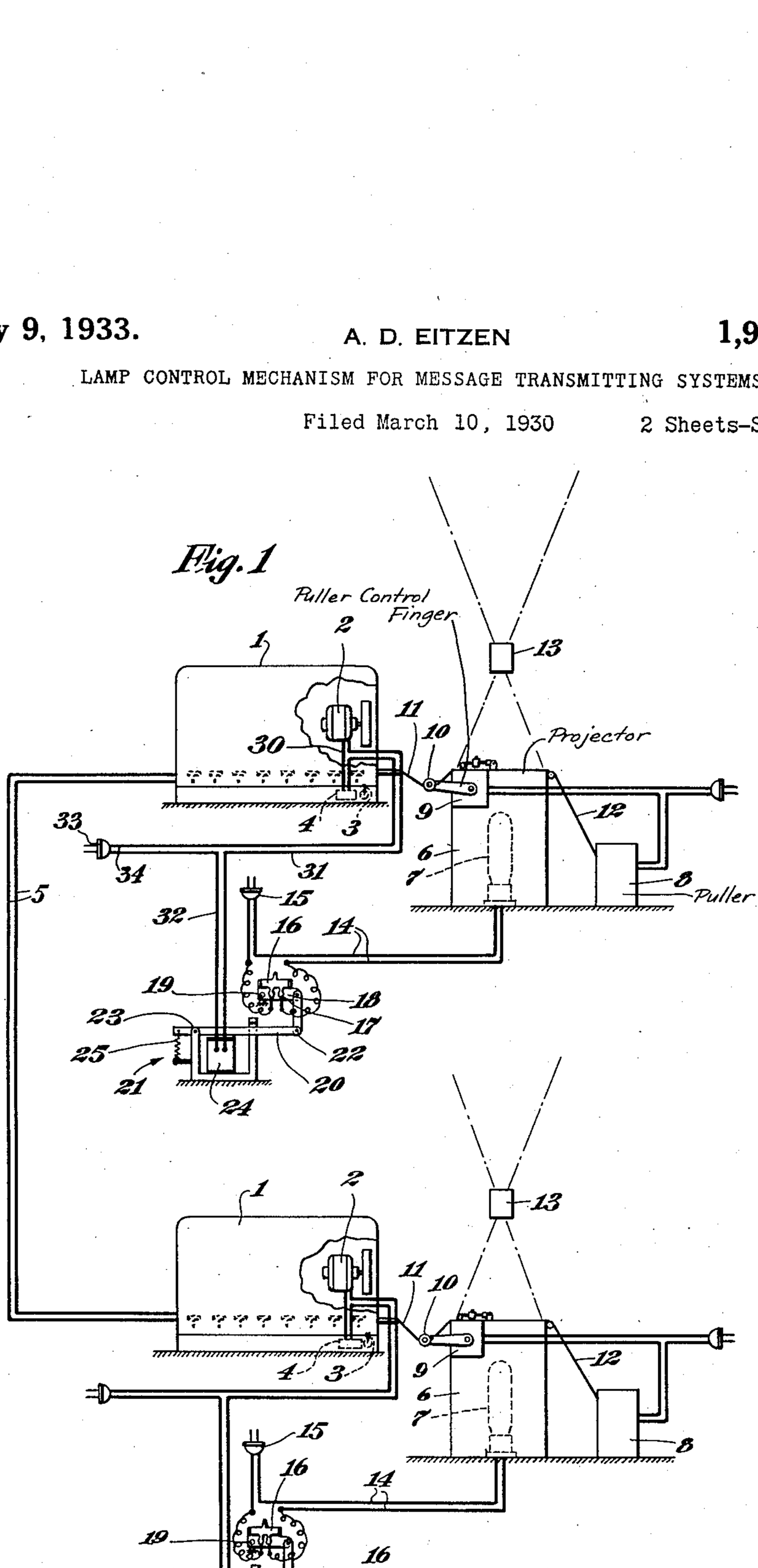
May 9, 1933. A. D. EITZEN 1,908,333

LAMP CONTROL MECHANISM FOR MESSAGE TRANSMITTING SYSTEMS

Filed March 10, 1930 2 Sheets-Sheet 1

Fig. 1



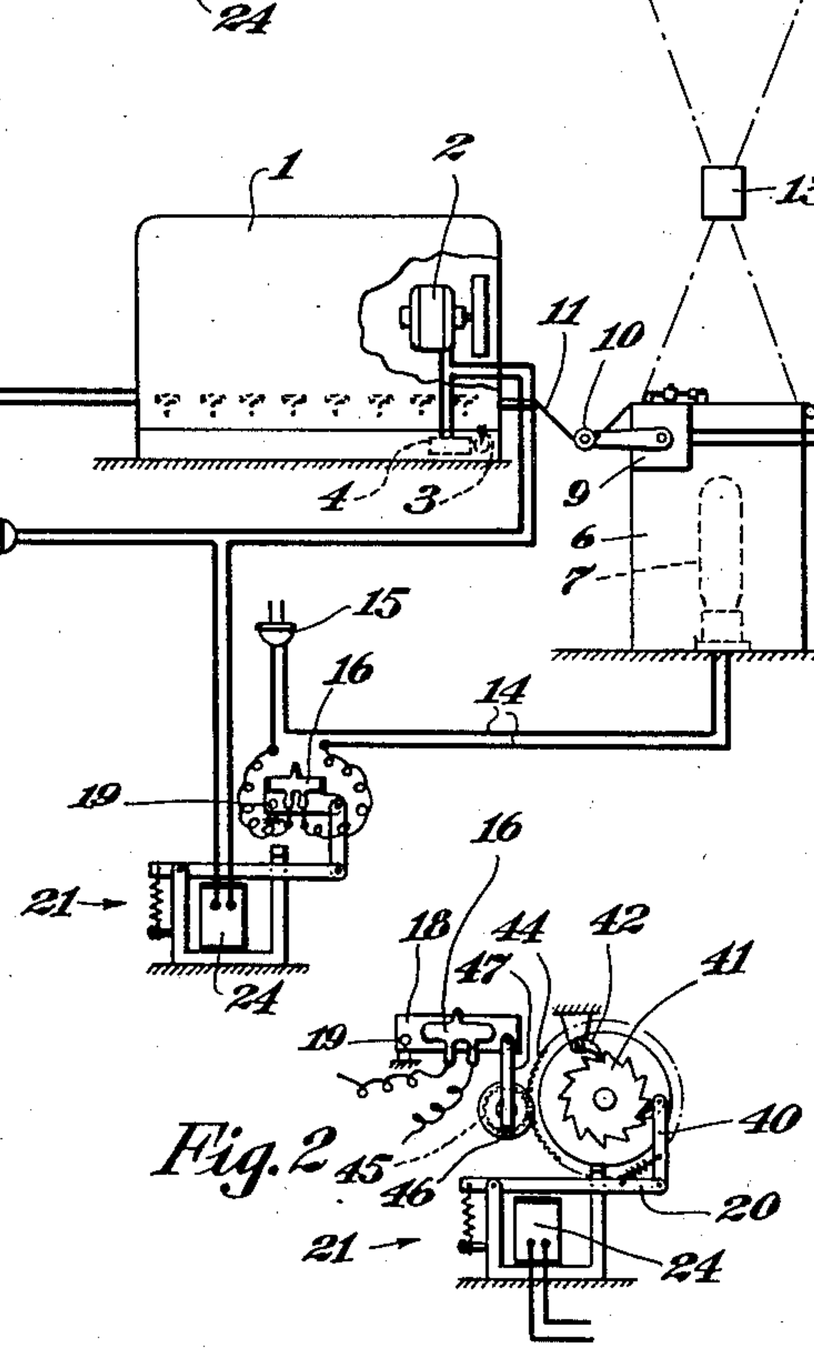


Fig. 2

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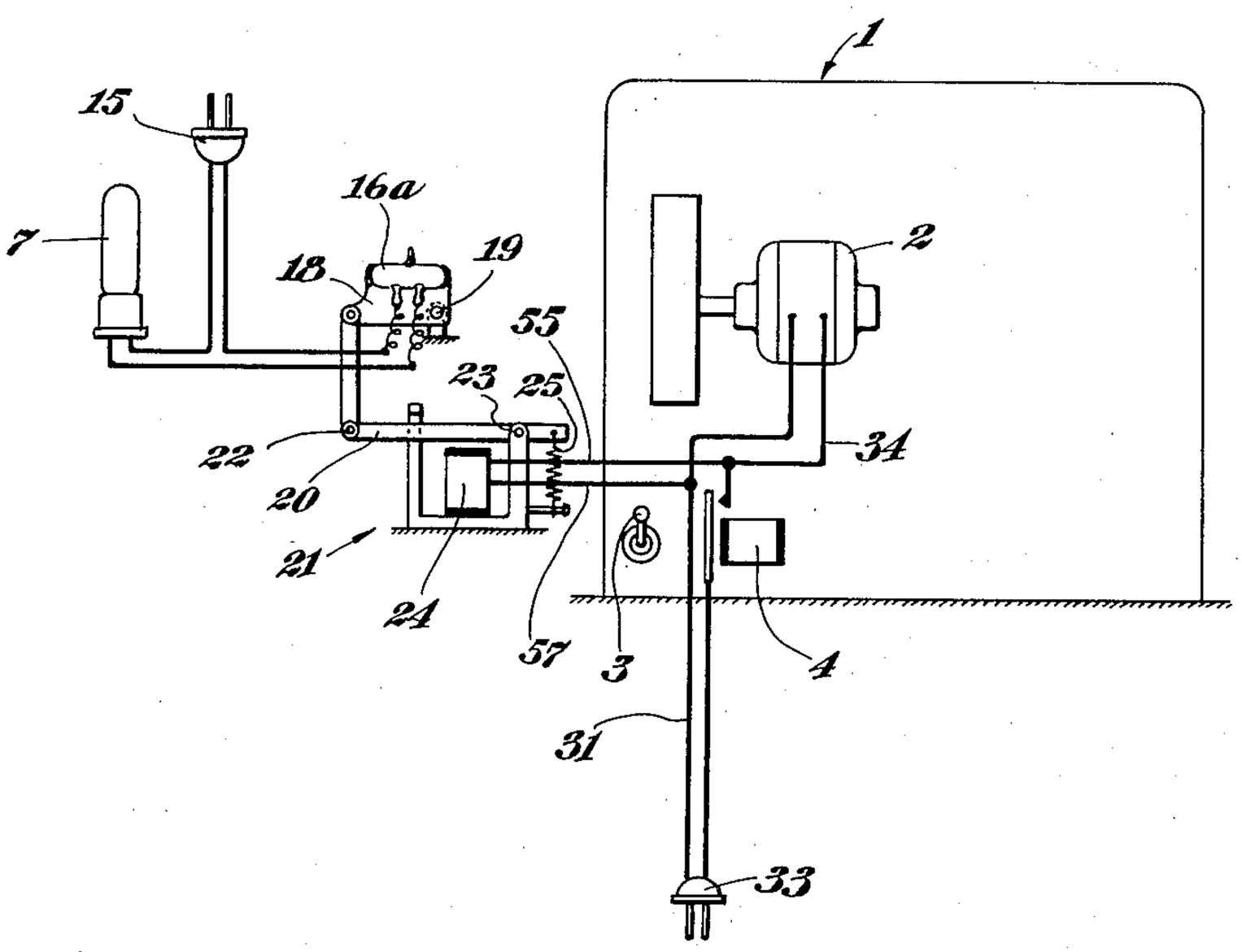
Fig. 3



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UNITED STATES PATENT OFFICE

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LAMP CONTROL MECHANISM FOR MESSAGE TRANSMITTING SYSTEMS

Application filed March 10, 1930. Serial No. 434,539. REISSUED

My invention relates to means for controlling the lamp circuits of projecting apparatus operated in conjunction with message transmitting or receiving instruments of the tape printing type.

The principal object is to control the lamp circuits of any or all of the projectors in the system from the controlling switch mechanism of the corresponding tape printing machine; and specifically to control the lamp circuit by means of a relay which is operated by the switch and relay mechanism of the printing machine and in turn actuates a mercury switch in the house current line and in circuit with the projector lamp, so that when the controlling switch of any printing machine in the system is moved to operative position the lamps of all the projectors in the system are lit by means associated with the individual tape printing and projecting units.

The motor of the tape printer draws only a small current while the projector lamp is of high wattage and draws more current than can be handled through the switch and relay of the tape printer. By arranging each projector lamp in an independent circuit, controlled by an individual switch and relay from the controlling relay of the corresponding tape printer, and especially when a mercury switch is used in the lamp circuit, the necessary high amperage is successfully handled and all the lamps in the system may be lit or extinguished coincidentally with the closing and opening of the motor circuits of all the printing machines in the system, without any complication or effect upon the action of the printing machine or its switch or relay mechanism and without necessity for running any line circuits through the building to interconnect the projector lamps of the different units.

One example of the utility of the invention is in the installation of such a message transmitting system in a hospital where it is desired to simultaneously visually present a message such as a call for a physician, on all of a plurality of screens located in different rooms, etc., and the lighting of all of the projector lamps simultaneously with placing the printing machines in condition for operation, causes the screens to be illuminated and directs attention to the message to be thrown upon the screen; and similarly when the transmission or projection of the message is discontinued the lamps are simultaneously extinguished and the screens are darkened.

The invention also includes provision for operating the printing machines or any of them without lighting the corresponding projector lamp. This is valuable in some cases, as in an intercommunicating system when it may be desired to transmit a message for reading directly from the tapes of the various printers and without throwing the legend upon the screen for general observation, as for example, in uses analogous to stock quotation transmitting systems, where it may be desired to transmit a message for the observation of brokers without throwing the message on the screen for observation by customers.

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

Fig. 1 is a diagrammatic view of a system and mechanism embodying the invention in one form;

Fig. 2 is a detail view of a modified switch operating mechanism; and

Fig. 3 is a diagram of a somewhat modified controlling circuit for the lamp switch relay.

In Fig. 1, 1—1 are any known or suitable tape printers or telegraphic printers, as viewed from the rear, representing any desired number in a system, any or all of which may be combined transmitters and receivers or any number of which may be arranged for operation as receivers only. Each of these machines includes a motor 2, and a controlling switch 3 for closing and opening the message transmitting circuit including a relay magnet for a relay mechanism 4, represented by the conductors 5, connecting all the printers, and simultaneously starting and stopping all of the mo-

tors. The switches are so arranged that any one of them will act to put all of the printers in operative or inoperative condition.

Associated with each printer is projecting apparatus comprising a projector proper 6, enclosing the lamp 7, a tape puller 8 for drawing the tape from the printer and across the light aperture of the projector, and a switch 9 controlled by a follower 10 running on a loop 11 of the tape 12 to control operation of the tape puller in accordance with the action of the printer, all as well understood by skilled persons, and as set forth in various of my previous applications. The projector of course includes suitable lenses, the objective lenses 13 only being represented and each objective is arranged to throw the light beam, with or without interposed mirrors, on a conveniently located screen (not shown).

For proper illumination, the lamps 7 are of high amperage, and for their proper control as and for the purposes above referred to, each lamp is connected as by conductors 14 and a plug 15 to the house circuit, and a suitable switch, preferably a mercury switch 16, is interposed in one of the conductors. This switch as illustrated is of a known type, consisting of a sealed glass shell or cartridge enclosing a body of mercury and also having pockets 17 containing separated contacts or wire terminals, outer portions of which are connected into one of the conductors 14, as shown. The switch cartridge is carried by a support 18 mounted to oscillate on the center 19, and is operated by the armature 20 of a relay 21, the armature being connected to the switch support as by a link 22. The armature is fulcrumed at 23 and is operated by a relay magnet 24 which acts against a spring 25 which normally moves the armature away from the magnet and tilts the switch to circuit breaking position.

The controlling relay 4 having a relay magnet in the message transmitting circuit 5, 5 of the tape printer 1 has one of its contacts or terminals connected to one of the motor terminals by a conductor 30, and from the other motor terminal a conductor 31 runs to one terminal of relay magnet 24. From the other terminal of this magnet a conductor 32 runs to one of the prongs of a plug 33 and from the other plug prong a conductor 34 runs to the other contact or terminal of the printer-controlling relay 4.

By the described arrangement each tape printer with its associated projector may be connected into the house circuit by merely inserting the two plugs in conveniently located plug sockets, and there is no necessity for inter-wiring of the different units and especially no necessity for inter-wiring for their lamp circuits. The circuit for the lamp is also kept separate from the power circuit for the tape printer so that the heavy current draw of the lamp has no effect upon the printing machine or its switch or relay mechanism. Whenever the controlling switch of any of the printers is thrown to operative position, all of the printer motors are started and the transmission line between the printers is energized, and simultaneously the current flow to each of the printer motors energizes the magnet of the corresponding relay 21, thus causing the corresponding mercury switch to move to circuit closing position and lighting the lamp, so that all of the projectors in the system illuminate their respective screens to call attention to the message about to be transmitted. When any controlling switch is moved to off position the printers are deenergized and simultaneously the relay magnets 24 are deenergized and all of the lamps are extinguished.

Fig. 2 shows a lamp-switch control mechanism arranged to permit message transmission selectively with or without lighting the projector lamps, in order, for example, to avoid throwing a transmitted message upon the screens, as referred to early above. In this arrangement the relay 21 may be as before, but its armature 20 has connected to it a spring-operated pawl 40 acting on a circular ratchet 41, which may have a detent pawl 42. The ratchet wheel is connected to a gear 44 engaging a pinion 45 and this pinion is connected by a crank pin 46 and link or pitman 47 to the switch support 18. The gear 44 and pinion 45 have diameters related to the number of teeth on the ratchet wheel 41. Thus, if there are twelve teeth on the wheel, as shown, the multiplying ratio as between gear 44 and the pinion will be six to one, in order to rotate the crank pin 46 one-half revolution about the pinion axis each time the pawl 40 moves the ratchet wheel one tooth space. This type of switch mechanism may be included in any or all of the projecting units.

When the operator at a control station closes the switch of the printing machine, to put the entire system in operating condition, if the parts of the lamp circuit control mechanism are in the position of Fig. 2, the energizing of magnet 24 will pull down the armature and pawl 40 will rotate the ratchet wheel one tooth space, thus rotating pinion 45 one-half revolution, whereby link 47 will tilt the switch support to circuit breaking position, so that the printing system has been placed in operation while the lamp circuits are broken. To close all the lamp circuits for projection simultaneously with message transmission, it is only necessary to move the controlling switch to off position and then again immediately to operative position, whereupon the relay magnet 24 will

again be energized and pinion 45 rotated another half-turn, or back to the position of Fig. 2, thus closing the lamp circuit. In this way the operator has selective control of the projectors in respect to their illumination, by the simple means of operating the printer controlling switch either one or two times.

Fig. 3 shows that the circuit for the relay magnet 24 may be different, or differently arranged in relation to the circuit of the motor 2 of the tape printer or printing telegraph 1. Thus, in Fig. 3 the relay magnet 24 is in parallel or shunt relation to the motor circuit, one lead 55 running from one side of the motor circuit to one terminal of the relay magnet and another conductor 57 running from the other side of the motor circuit to the other terminal of the relay magnet. The lamp circuit including the mercury switch 16*a* is easily traced without explanation. The operation is the same as explained in connection with Fig. 1.

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

I claim:—

1. In combination with a projector including a lamp, a message transmitting circuit including the relay magnet of a controlling relay and a tape printer including a motor and a motor circuit operatively associated with said relay magnet, a lamp circuit including said lamp and a switch, and a second relay including a relay magnet for operating the switch associated with said lamp circuit, said first relay magnet being energized when a message is transmitted to said printer in turn to close the motor circuit to operate the motor, and the relay magnet of said second relay being thereupon energized when current flows through said motor circuit in turn to close said lamp switch.

2. In apparatus or a system of the class described, in combination with a message transmitting circuit including the relay magnet of a controlling relay, a tape printer including a motor and a motor circuit, operatively associated with said relay magnet, and a projector including a lamp, an independent lamp circuit including a mercury switch, and a second relay connected to operate the switch, the relay magnet for said latter relay being included in said motor circuit, whereby the lamp circuit is closed when the printer is put in operative condition, and broken when the printer is inoperative, the relay magnet of the controlling relay being energized when a message is transmitted to said printer in turn to close the motor circuit to operate the motor, and the relay magnet of said second relay being thereupon energized when current flows through said motor circuit in turn to close said mercury switch.

3. In combination with a projector including a lamp and a tape printer including a motor, a motor circuit and a controlling relay in said circuit, a lamp circuit including said lamp and a switch, a relay for operating the switch and included in said motor circuit, and means intermediate the lamp circuit controlling relay and the lamp switch and acting selectively by repetitious actions of the tape printer controlling relay to illuminate or extinguish the lamp while the printer is in active condition.

4. In combination with a projector including a lamp and a tape printer including a motor, a motor circuit and a controlling relay in said circuit, a lamp circuit including said lamp and a switch, a relay for operating the switch and included in said motor circuit, and means intermediate the lamp circuit relay and the switch for moving the switch to closed circuit position by one actuation of the relay and to open circuit position on the next actuation of the relay.

5. A communication system of the character described comprising a message transmitting circuit including the relay magnet of a controlling relay, and a plurality of units, each unit comprising a printer including a motor and a motor circuit operatively associated with said controlling relay, and a projector including a lamp, an independent lamp circuit including a mercury switch, and a second relay connected to operate the switch, the relay magnet for said second relay being included in said motor circuit, whereby the lamp circuit is closed when the printer is put in operative condition, and broken when the printer is inoperative, said controlling relay being actuated when a message is transmitted to said printer in turn to close the motor circuit to operate the motor, and the relay magnet of said second relay being energized when current flows through said motor circuit to close said switch.

6. A communication system of the character described comprising a plurality of units, each unit comprising a printer including a motor, a motor circuit and a controlling relay in said circuit, a projector including a lamp, a lamp circuit including said lamp and a switch, a relay for operating the switch and included in said motor circuit, and means intermediate the lamp circuit controlling relay and the lamp switch and acting selectively by repetitious action of the tape printer controlling relay to illuminate or extinguish the lamp while the printer is in active condition.

7. A communication system of the character described comprising a message trans-

mitting circuit operatively associated to operate a controlling relay, and a plurality of units, each unit comprising a printer including a motor and a motor circuit operatively associated with said controlling relay, and a projector including a lamp, an independent lamp circuit including a mercury switch, a second relay connected to operate the switch, the relay magnet for said second relay being included in said motor circuit, whereby the lamp circuit is closed when the printer is put in operative condition, and broken when the printer is inoperative, and means intermediate the lamp circuit relay and the switch for moving the switch to closed circuit position by one actuation of the relay and to open circuit position on the next actuation of the relay, said controlling relay being actuated when a message is transmitted to said printer in turn to close the motor circuit to operate the motor, and the relay magnet for said second relay being energized when current flows through said motor circuit in turn to close said lamp switch.

8. In combination with a message transmitting circuit including the relay magnet of a controlling relay, a projector including a lamp, and a tape printer including a motor and a motor circuit operatively associated to be controlled by said controlling relay, a lamp circuit including said lamp and a switch, a second relay for operating the switch and included in said motor circuit, and means intermediate said second relay and the lamp switch and acting selectively by repetitious actions of the tape printer controlling relay to illuminate or extinguish the lamp while the printer is in active condition.

9. In combination with a message transmitting circuit including the relay magnet of a controlling relay, a projector including a lamp, and a tape printer including a motor and a motor circuit operatively associated to be controlled by said controlling relay, a lamp circuit including said lamp and a switch, a second relay for operating the switch and included in said motor circuit, and means intermediate said second relay and said switch for moving the switch to closed circuit position by one actuation of the second relay and to open circuit position on the next actuation of said second relay.

10. A communication system of the character described comprising a message transmitting circuit operatively associated to operate a controlling relay and a plurality of units, each unit comprising a printer including a motor and a motor circuit controlled by said controlling relay, a projector including a lamp, a lamp circuit including said lamp and a switch, a second relay for operating the switch and included in said motor circuit, and means intermediate said second relay and said switch and acting selectively by repetitious action of the tape printer controlling relay to illuminate or extinguish the lamp while the printer is in active condition.

11. In apparatus or a system of the class discribed, in combination with a message transmitting circuit including the relay magnet of a controlling relay, a tape printer including a motor and a motor circuit operatively associated with said relay magnet, and a projector including a lamp, an independent lamp circuit including a switch, and a second relay connected to operate the switch, the relay magnet for said latter relay being included in said motor circuit, whereby the lamp circuit is closed when the printer is put in operative condition, and broken when the printer is inoperative, the relay magnet of the controlling relay being energized when a message is transmitted to said printer in turn to close the motor circuit to operate the motor, and the relay magnet of said second relay being thereupon energized when current flows through said motor circuit in turn to close said switch.

12. A communication system of the character described comprising a message transmitting circuit including the relay magnet of a controlling relay, and a plurality of units, each unit comprising a printer including a motor and a motor circuit operatively associated with said controlling relay, and a projector including a lamp, an independent lamp circuit including a switch, and a second relay connected to operate the switch, the relay magnet for said second relay being included in said motor circuit, whereby the lamp circuit is closed when the printer is put in operative condition, and broken when the printer is inoperative, said controlling relay being actuated when a message is transmitted to said printer in turn to close the motor circuit to operate the motor, and the relay magnet of said second relay being energized when current flows through said motor circuit to close said switch.

13. A communication system of the character described comprising a message transmitting circuit operatively associated to operate a controlling relay, and a plurality of units, each unit comprising a printer including a motor and a motor circuit operatively associated with said controlling relay, and a projector including a lamp, an independent lamp circuit including a switch, a second relay connected to operate the switch, the relay magnet for said second relay being included in said motor circuit, whereby the lamp circuit is closed when the printer is put in operative condition, and broken when the printer is inoperative, and means intermediate the lamp circuit relay and the switch for moving the switch to closed circuit position by one actuation of the relay

and to open circuit position on the next actuation of the relay, said controlling relay being actuated when a message is transmitted to said printer in turn to close the motor circuit to operate the motor, and the relay magnet for said second relay being energized when current flows through said motor circuit in turn to close said lamp switch.

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