

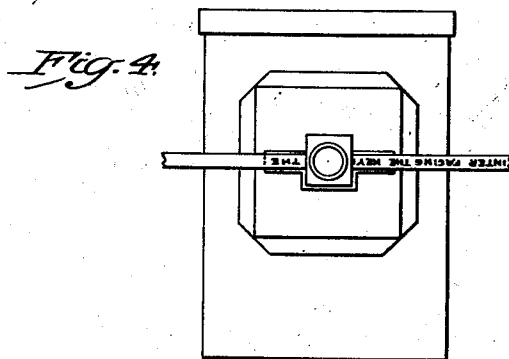
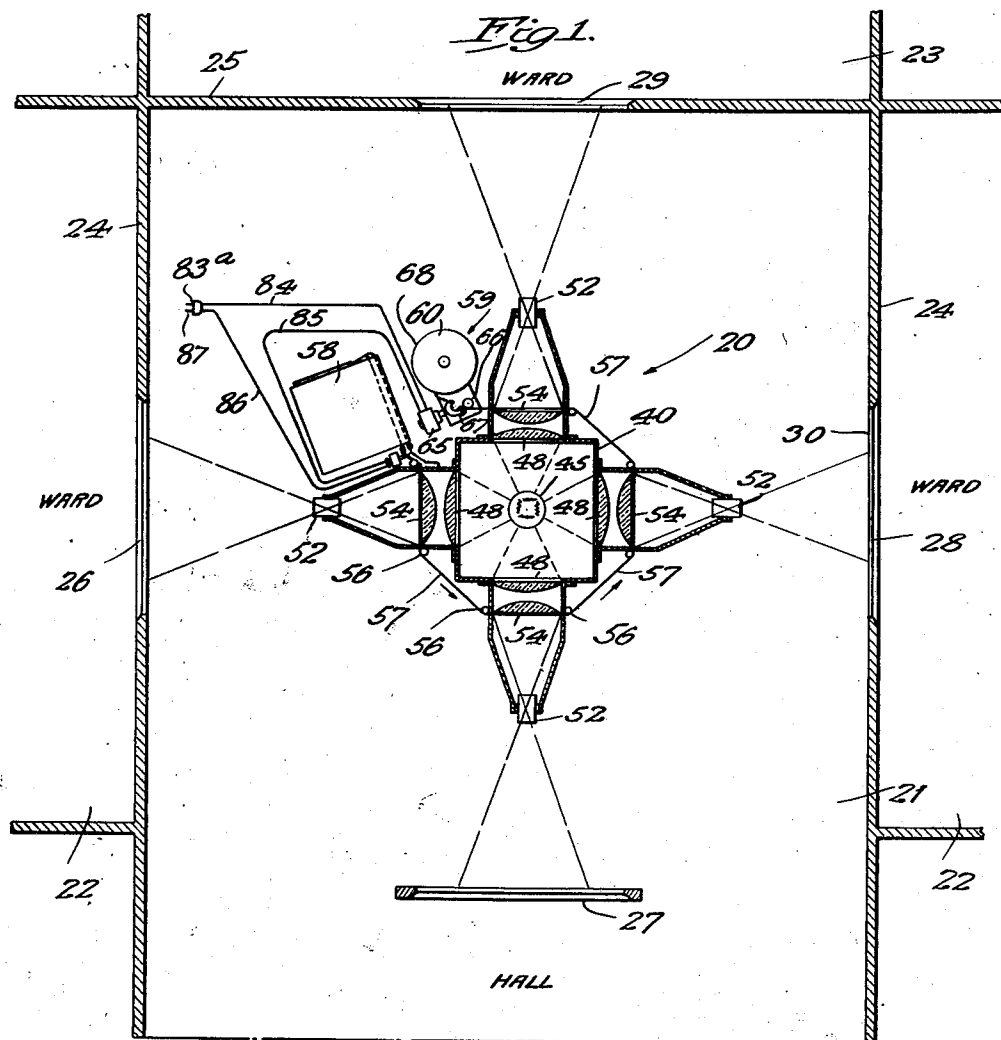
Feb. 8, 1938.

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2,107,290

PROJECTING APPARATUS AND SYSTEM

Original Filed March 20, 1930 5 Sheets-Sheet 1



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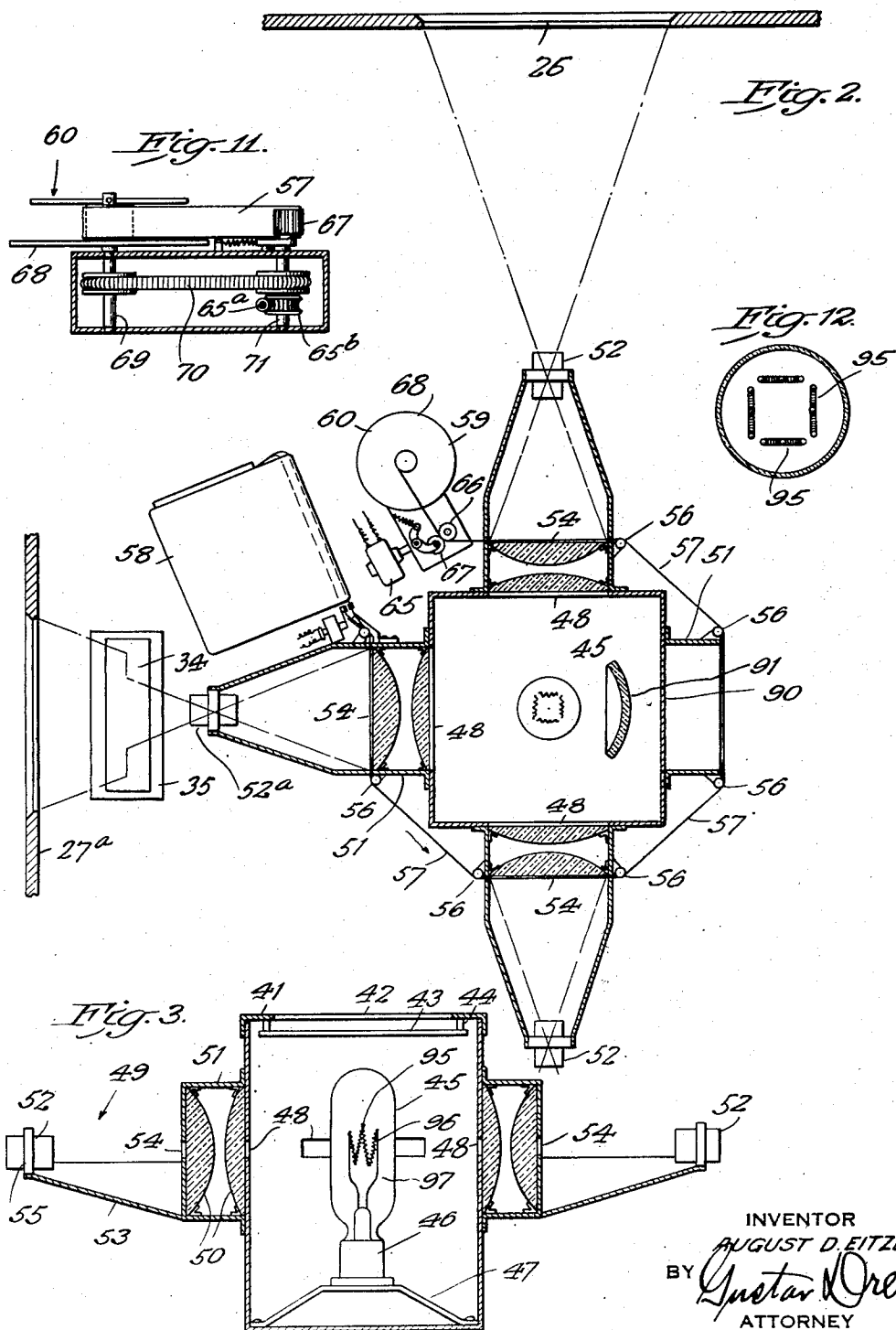
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PROJECTING APPARATUS AND SYSTEM

Original Filed March 20, 1930 5 Sheets-Sheet 2



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PROJECTING APPARATUS AND SYSTEM

Original Filed March 20, 1930 5 Sheets-Sheet 3

Fig. 5.

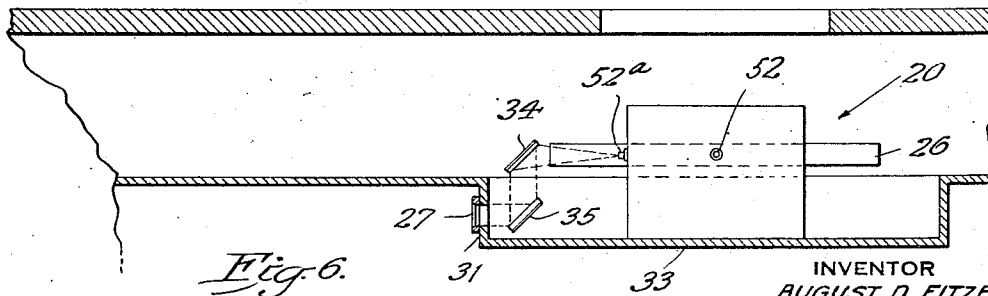
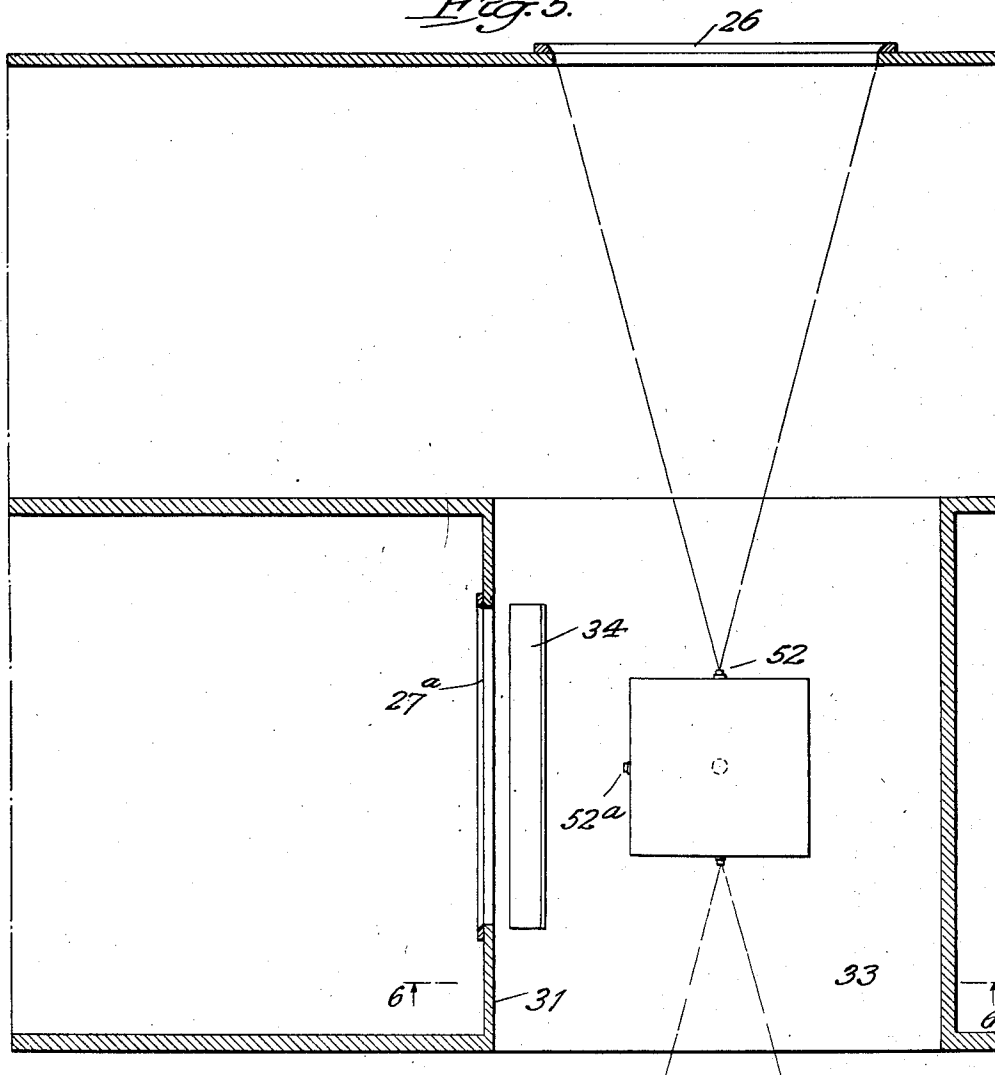


Fig. 6.

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PROJECTING APPARATUS AND SYSTEM

Original Filed March 20, 1930 5 Sheets-Sheet 4

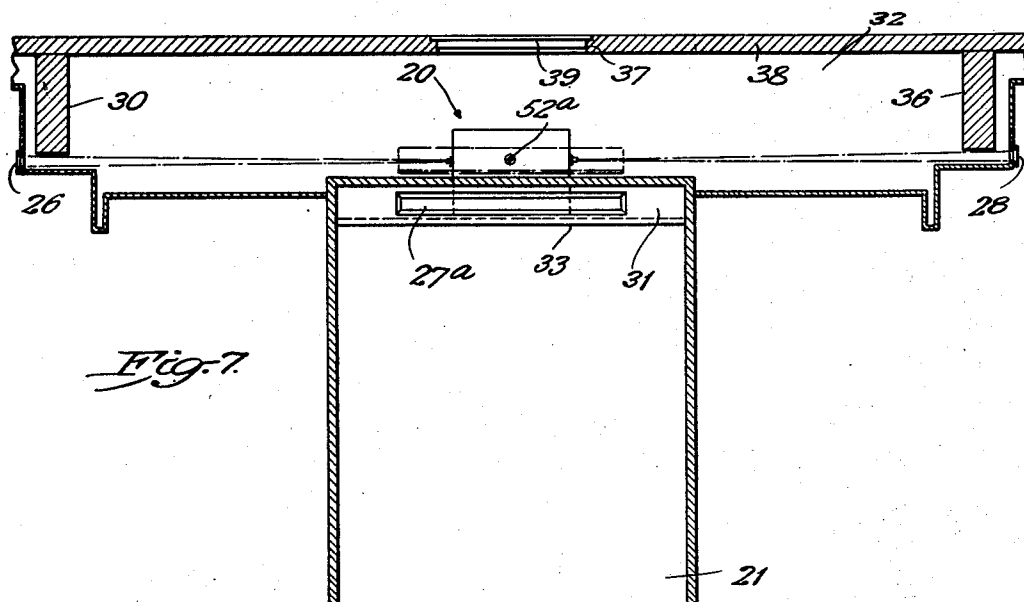


Fig. 7

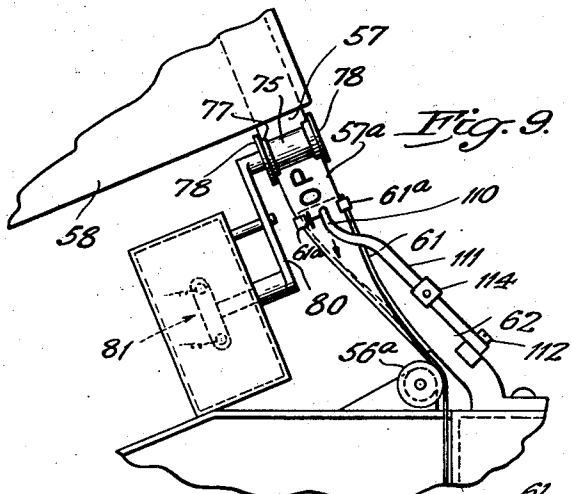


Fig. 9

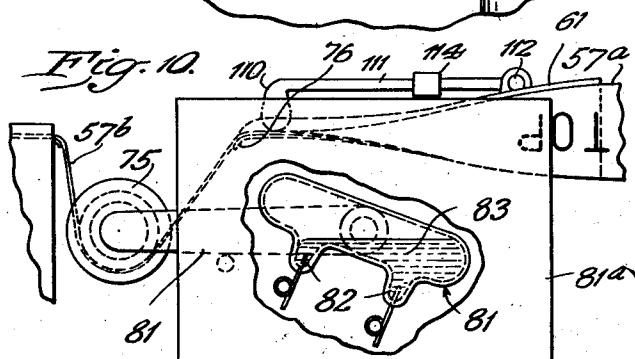


Fig. 10

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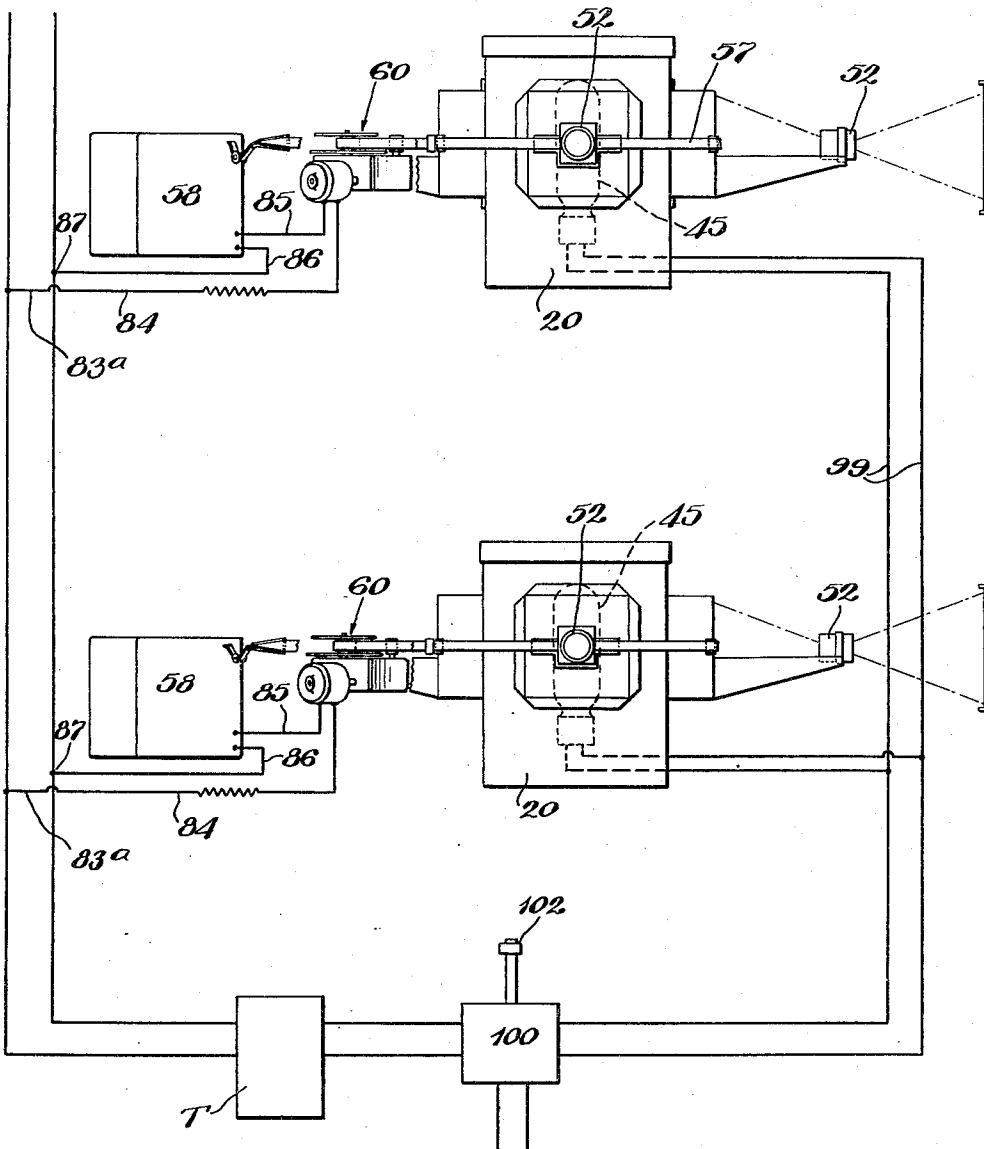
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PROJECTING APPARATUS AND SYSTEM

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Fig. 8.



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PROJECTING APPARATUS AND SYSTEM

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Application March 20, 1930, Serial No. 437,304
Renewed September 26, 1936

19 Claims. (Cl. 88—24)

The invention relates to apparatus for projecting on a screen the image of a printed strip or tape, such as a tape issuing from an automatic printing machine, and to signalling or message transmitting systems or the like including a plurality of such apparatus or mechanisms.

A principal object is to provide a single projecting apparatus or mechanism in which a plurality of images may be projected from one light source and one tape upon a corresponding number of screens in different desirable locations.

The advantage and various uses of the invention will be understood from the present explanation of a representative embodiment, as designed or adapted for use in such a location or building as a hospital, where it is desirable to communicate simultaneously with persons in various rooms or corridors through the building, as for example, to transmit (visually) a "call" to a physician who may at the time be in any one of a number of wards, private rooms, corridors, operating rooms, etc.

For this and analogous purposes the invention in a preferred form comprises, as briefly described, a lamp housing with preferably a single lamp therein and having a plurality of light apertures, and a corresponding plurality of suitable projecting lenses in generally radial arrangement on or about the housing; a tape printer, a tape puller, and suitable controlling means co-ordinated with the printer for moving the tape from the printer in a generally circuitous course about the light housing and over the successive apertures, together with screens properly located in desired positions to receive the beams from the respective projectors; and where necessary, mirrors to direct the beam where the projecting lens is not aligned with the screen. Thus, when an image is repetitiously or otherwise printed upon the tape it may, under control of the operator at the central or transmitting station, be presented simultaneously or successively at each of the light apertures of one or any desired plurality of the multiple projectors, each of which will thereupon present the message or communication on the corresponding plurality of screens.

The invention also includes certain novel arrangements or features of building construction for the proper location of one or more of the multiple projectors, screens, etc.

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 view in horizontal section through a suitable building compartment and a multiple projecting apparatus therein, embodying the invention in one form;

Fig. 2 is a similar view of a modified projector;

Fig. 3 is a vertical section of the projector proper in the plane of two oppositely located sets of projecting lenses;

Fig. 4 is a side elevation of the projector proper;

Fig. 5 is a view in horizontal section through a building compartment of somewhat different form or arrangement, showing in plan a multiple projector therein;

Fig. 6 is a vertical section at 6—6, Fig. 5;

Fig. 7 is a vertical section of the same installation or building compartment and screen arrangement;

Fig. 8 is a partial diagrammatic representation of a system including a plurality of multiple projectors and showing especially the telegraphic and lamp circuits;

Fig. 9 is a top plan, enlarged, of a portion of the tape printer and adjacent portion of the projector, showing the tape going from one to the other, control means for the tape puller, etc.;

Fig. 10 is a view, somewhat diagrammatic, in elevation from the lower left of Fig. 9;

Fig. 11 is a sectional detail of the tape puller and tape take-up or rewind mechanism; and

Fig. 12 is a horizontal section of a projecting lamp having a desired filament arrangement for present purposes.

The invention throughout will be described as adapted for hospital purposes, and each multiple projecting apparatus will be described with reference to its location in a building such as a hospital building or in a compartment thereof, with suitable screen locations or arrangements; but it will be understood that this is only by way of example and to enable the principles and advantages to be understood, and that broadly there is no limitation as to the particular location or uses of the apparatus and that the multiple projector may be used in many cases without any special arrangement or construction or reconstruction of the building or apartment in which it is placed.

In Fig. 1, one complete multiple projecting apparatus 20 is placed in an upper compartment, or near the ceiling of a hallway 21. Rooms or wards 22 and 23 are separated from the hallway as by side and end walls 24 and 25 respectively, and screens 26, 27, 28, and 29 are properly located to receive different image beams from the projector. Thus screens 26, 28, and 29 are

mounted in wall apertures 30 and screen 27 is in a frame supported near the hall ceiling. The screens are located between the projector and the observer, who looks at the side of the screen away from the projector, and are of suitable translucent character or material so that the image may be observed thereon in daylight or with ordinary room lighting.

Fig. 1 shows an arrangement or mode of projecting each image directly upon the corresponding screen without the use of mirrors and with avoidance of light loss caused by mirrors.

Figs. 2, 5, 6, and 7 illustrate a somewhat different arrangement, especially with regard to one of the screens, such as the hall screen 27a, which is located on a shallow vertical partition wall 31 at the top of the hallway, and below the axis of the corresponding projector objective 52a. The projector 20 is located in a ceiling compartment 32 having a depressed or false ceiling 33 below the level of the vertical portion 31, and mirrors 34 and 35 are placed in superposed relation and at suitable angles, which may be 45° to the vertical, to reflect a light beam to screen 27a located below the axis of the projector objective. Thus, mirror 34 receives the beam from the objective and reflects it to mirror 35, which reflects it to the screen. Other of the objectives, 52 direct their light beams directly to the screens such as 26 and 28 located in vertical wall portions of adjacent rooms such as wards, spaces being left in or below the floor beams 36 of the floor next above, for passage of the light rays, as well shown in Fig. 7.

This arrangement of the projector in a ceiling compartment or as otherwise described, a sub-floor compartment, puts it in a position where it is out of the way, allows for direct projection to some screens and indirect projection by use of mirrors to one or more other screens, and at the same time the projector may be readily accessible for servicing by providing an aperture 37 in the floor 38, with a removable cover 39, giving direct access to the projector from above.

The projector proper in the form shown includes a lamp housing 40 which may be rectangular or especially four-sided in case quadruple projection is desired, although the shape may be modified in case there are other numbers of light apertures and lens groups, or for other reasons. The lamp housing has a removable cover 41 to give access to the lamp, and this cover desirably has ventilating means. As shown, it has a central aperture 42 with an inner horizontal plate 43 of greater dimensions than the aperture, and suspended below the top of the cover by spacers 44, thus giving ample ventilation around plate 43 and through the aperture. The incandescent bulb 45 is removably located in a suitable socket 46 which may be elevated above the floor of the housing as by a bracket 47 to bring the lamp to proper position in relation to the light apertures.

In each side wall of the housing is a light aperture 48 of a length equal to a considerable length of tape, or sufficient to provide for the desired message length, and a lens group 49 is axially aligned with the center of each aperture. Each lens group as shown includes suitable condensers such as 50 in a condenser casing 51 secured to the housing wall, and suitable objectives in a case 52 axially aligned with the condensers and supported by an arm or bracket 53 extending from the lens casing 51. The condenser casing 51 has in its outer wall a second or outer light aper-

ture 54 corresponding substantially in area and position to the inward one.

Provision may be made for focusing any or all of the light beams, in view of varying distances to the respective screens, for example. For this purpose the objective casing 52 may be slidably mounted in a supporting ring 55, or other adjustments may be provided as in standard practice.

For each of the outer light apertures 54 there is guide means consisting usually of pulleys 56 revolvably mounted at opposite sides of the condenser casing, these pulleys having end flanges and being designed to properly receive and guide the tape 57 from the tape printer 58 in a horizontal course over or in front of each of the apertures in succession, and finally to the tape puller 59, which includes rewinding mechanism 60.

The tape printer 58 may be of any known or suitable kind for automatically printing characters on a tape and advancing the tape, under control of a master printer or transmitter at a central station as indicated at T in Fig. 8, according to conventional practice in ticker systems. In the usual construction or arrangement of such printing machines the tape issues from the ticker in a horizontal plane with the printed side up and in the relative position indicated in Fig. 9 by the printed word "Top". The invention preferably includes means and arrangement for repositioning or directing the tape to the projector proper in an efficient and simple manner, involving only a short stretch of tape between the printer and the first light aperture and only a moderate or one-quarter transverse twist in the tape, and in such manner that the printed characters are presented at the light apertures in proper position for direct projection upon a screen, whereupon they will appear right side up and when moving, will move from right to left thereon, or so that they will "read" from left to right in the normal way. Thus, the tape after it passes a short distance from the tape aperture in the printer passes over the curved face of a guide plate 61 (see Fig. 9) supported on a bracket 62 from the projector housing, this guide plate being formed to give the tape a transverse one-quarter twist or bend, which may be accomplished by the means shown with a very short stretch of tape between the printer and projector and without undesired strain on the tape. The printer is also preferably set in a diagonal or oblique relation to the projector as best explained in Figs. 1 and 2, so that the one-quarter turn or twist in the tape may be made in a most direct manner and in a portion of the tape which is approximately straight in the longitudinal direction. As it leaves the guide 61 the tape passes about a guide pulley 56a (see Fig. 9) which properly directs it over the first light aperture and to the pulley 56 at the opposite side thereof.

In this manner the edge 57a of the tape as it leaves the printer is brought to upward position as the tape reaches the projector and passes the apertures in vertical planes, thus keeping the printed matter on the outer face of the strip and in inverted position as shown in Fig. 4. The corresponding objective reverses the image and direction of tape movement so that when the image is observed on the screen from a position above referred to, that is, from the side of the screen away from the projector, the image is right side up and moves from right to left, per-

mitting reading from left to right in the normal way. When the light beam must be deflected by mirrors as above referred to, the use of two mirrors provides a double inversion of the image between the projector and the screen so that the image in such cases also appears upon the screen in the same manner.

The tape guide such as 61 may have at its leading end upwardly or outwardly projecting side flanges 61a cooperating with edges of the tape to prevent lateral displacement.

Preferably, also, I provide frictional tape retarding means acting on the tape at a point anterior to the first light aperture, to equalize the tape movement and prevent jerking of the tape as it comes from the printer, caused by actions of the tape puller, etc. Thus, as here shown, I provide a frictional retarder 110 (Figs. 9 and 10) arranged to bear on the tape at a point near the leading end of the guide 61 or other convenient point anterior to the first light aperture. This retarder is carried by an arm 111, pivotally mounted at 112 on the guide supporting arm 62 and the arm may have an adjustable weight 114 for regulation of the friction pressure. Motion of the tape is thus frictionally retarded or equalized between the friction device and the tape puller.

The tape puller 59 and rewind mechanism 60 may be of any known or suitable kind. As shown it includes a motor 65 connected in a known manner, by a worm 65a and worm gear 65b, to a main feed roll 66 with which a spring pressed idler 67 cooperates to grip and feed the tape. The rewind spool 68 mounted on a shaft 69 is yieldably or frictionally driven as by a helically coiled spring belt 70 from shaft 71 of the tape feed driving mechanism, so that the driving connection may yield or slip as the diameter of the rewound tape increases, thus avoiding any improper pull on the tape or pulling means 66, 67.

For control of the motor, or other suitable control of the tape puller, to advance the tape in accordance with the action of the printing machine, a follower in the form of a roll or finger 75 runs on the tape between the printer and the leading end of guide 61, the tape at that point having a certain normal downward bend or loop 57b, Fig. 10, and the guide having its leading end down curved as at 76 to smoothly receive the tape at any angle from the finger. Since the finger or other follower 75 engages the printed face of the tape, it is preferably designed to avoid smearing the print. For this purpose the finger has near its ends short cylindrical shoulders or flanges 77 engaging margins of the tape, at either side of the printed portion, and the central portion of the finger between the annular shoulders is of reduced diameter, so that the roll cannot touch any of the printed matter. At either side of the shoulders 77 are flanges 78 overlapping the edges of the tape for lateral guiding. The same arrangement may be made with respect to any pulley such as 56a which acts on the printed side of the tape before it has had time to dry. Thus, pulley 56a for example, may have the annular shoulders or flanges 77 and if desired, edge flanges 78 and a recessed central portion, as described with reference to finger 75.

The follower or control finger 75 is carried by an arm 80, which arm controls in any known or suitable way any suitable switch, such as the mercury switch 81 of any known form, in switch box 81a. The switch has contacts 82 which are

operatively connected by the movement of a mass of mercury 83 within the switch cartridge or capsule, as the latter is tilted under control of finger 75 and arm 81. The contacts are in series in the circuit of the tape pulling motor 65 or equivalent puller controlled means. The motor control circuit is sufficiently indicated in Fig. 1, in which one of the plug prongs 83a connects to one side of the power line; the circuit is then from the plug prong to the motor 65 through conductor 84; from the motor through conductor 85 to one of the switch contacts 82, and from the other contact through conductor 86 to the second plug prong 87 and other side of the line.

In operation, in accordance with one mode of procedure, the operator at the central station writes a message on the transmitter which is in circuit with one or more of the above described projection mechanisms. If it is desired to have the message presented simultaneously on all four screens of a quadruple projection, as above described, the message is written four times, and each of the duplicate messages is spaced from the other by proper manipulation of a spacer key or equivalent means in the transmitter, the operator by observation of a master printer or master screen being able to properly space the message with regard to the distance between the successive light apertures of the projectors. Thereupon when the message is written the fourth time and the tape advanced by spacing or other operations a suitable distance, all four typed messages are presented in registry with the four successive light apertures, and the tape is then permitted to remain stationary for a suitable time for observation of the messages on the different screens. Otherwise the message may be written only once and passed successively before the successive light apertures, with or without a pause at each one, by proper manipulation of the transmitter spacer or equivalent device. If a long message is continuously written it may be read as it passes continuously over the successive light apertures.

In any case the above described tape puller and control means provides for the proper advancing of the tape over the successive light apertures, in accordance with the rate of delivery of the tape from the printer. Thus, if the printer stops with the control circuit closed, as shown in Fig. 10, the tape puller continues to pull the tape until the loop 57b is shortened to a pre-determined extent and thereupon tilting of the mercury switch breaks the circuit between the contacts, and the puller stops and tape advance ceases; when the printer again starts, the printed tape is advanced therefrom and when the loop is thus lengthened to a pre-determined point the switch is tilted in the opposite direction or to the position of Fig. 10, closing the motor circuit or otherwise acting on the puller control to cause the puller to again pull the tape at a rate approximately proportional to the average speed of the printer; and in an obvious way the control mechanism will thus take care of starting and stopping of the printer or varying speeds of operation thereof, without jerking or breaking the tape.

Fig. 2 shows certain modifications in the projector proper, representing a case in which it is unnecessary to use one of the projecting lens sets and corresponding screen, or when it is desired to increase the illumination supplied to one of the projected beams, as for example when the corresponding screen is located a greater dis-

tance from the projector or if the beam must be deflected through mirrors which absorb some of the light. In this case one of the sets of lenses, at the right in Fig. 2, is omitted and the condenser lens casing 51 in this case becomes merely a frame or support for the guide rolls 56 at that side to properly direct the corresponding stretch of the tape; and the lamp housing wall 98 at that side may then be made solid. To fully utilize the light available for the projecting lenses at the left in Fig. 2, a reflector 91 of suitable character or shape is placed within the housing to reflect light from the lamp 45 and increase the intensity of the beam through the projecting lenses 52a, with which the reflector is aligned.

It is desirable in some cases to provide a special type of lamp or a new and improved arrangement of the filament, in order to concentrate the available light output most effectively with relation to the respective projecting lenses. Thus, in the case of a quadruple projector, the incandescent filament may be arranged as shown in Figs. 3 and 12. Each active part of the filament is arranged substantially as a grid 95 in each of which there may be a plurality of diagonally arranged stretches 96 of the luminous filament, these being properly supported on rods or wires in a normal manner. The two ends of the complete grid 95 may be supported on rods or wires 97 and the ends of the respective grids may be connected by non-luminous conductors. Each grid is aligned or directed toward one of the sets of projecting lenses, its plane being perpendicular to the lens axis. This filament or grid arrangement therefore represents a concentration of the total luminous filament in a manner most advantageous for the present purpose, namely, the projection of a plurality of light beams in different directions.

The invention, as previously indicated, includes a system incorporating a plurality of multiple projectors as above described, in conjunction with a transmitter. Fig. 8 diagrammatically represents certain principal essentials of such a system in which the separate multiple projectors are sufficiently indicated by the lamps 45, one for each projector. The controlling or energizing circuits for the printing mechanisms proper and for the tape pulling motors of the various projecting mechanisms carry only moderate current and arrangements for these circuits may be of any known or suitable nature, and they are therefore not shown. The projecting lamps, however must have high candle power and they draw a large amperage requiring a heavy duty switch for proper control of the lamp circuit. Thus, the lamps 45 are in parallel between the system light circuit conductors 99, and a heavy duty switch 100 is interposed between these contacts and the outside line conductors 101, this switch being operated in any suitable way, as by a push button 102 acting through a relay or equivalent means, so that the light circuit switch may, if desired, have remote control. In a preferred mode of operation the central operator will close the light circuit only when a message is to be projected, whereupon the illumination of the screen will serve as a signal to draw attention to the message about to be transmitted; and when transmission is discontinued the light circuit is broken and the screens are darkened.

It will also be evident to skilled persons that various other changes, modifications or adaptations may be made within the scope of the appended claims.

I claim:—

1. A visual message transmitting or exhibiting system, comprising a transmitter and a plurality of distributed projecting mechanisms each including a tape printer, a source of light, a plurality of sets of projecting lenses in generally radial arrangement about said light-source, and a plurality of screens each positioned to receive the projected beam from one of the lens sets, and means for automatically advancing the tape from the printer to and through the projector in accordance with the action or rate of operation of the transmitter, the printers being included in an electrical circuit with, and arranged for simultaneous operation by, said transmitter.

2. A visual message transmitting or exhibiting system, comprising a transmitter and a plurality of distributed projecting mechanisms each including a tape printer, a source of light, a plurality of sets of projecting lenses in generally radial arrangement about said light-source, and a plurality of screens each positioned to receive the projected beam from one of the lens sets, and means for automatically advancing the tape from the printer to and through the projector in accordance with the action or rate of operation of the transmitter, the printers being included in an electrical circuit with, and arranged for simultaneous operation by, said transmitter, each light-source comprising a lamp, and a lamp-circuit including a switch for simultaneous control of the lamps.

3. A visual message transmitting or exhibiting system, comprising a transmitter and a plurality of distributed projecting mechanisms each including a tape printer and means for automatically advancing the tape from the printer to and through the projector in accordance with the action or rate of operation of the transmitter, the printers being included in an electrical circuit with, and arranged for simultaneous operation by said transmitter, each projecting mechanism including also a light-source, a plurality of light apertures and a projecting lens aligned with each of said light apertures, and a screen to receive the projected beam from each lens, said tape-advancing means being adapted to feed said tape past all of said light apertures successively.

4. A visual message transmitting or exhibiting system, comprising a transmitter and a plurality of distributed projecting mechanisms included in an electrical circuit with said transmitter, each projecting mechanism including a lamp, a plurality of sets of projecting lenses in generally radial arrangement about the lamp, a tape-printer and a tape-puller arranged respectively to mark the tape and draw the marked tape past said lens sets, thereby to create a plurality of light-beams carrying images of the markings on said tape, a screen positioned to receive the projected beam from each of the lens sets, one screen being in a position out of line with the corresponding light beam from the projector, and mirrors arranged to throw each beam upon one of the screens.

5. In combination, a multiple projector including a central light source, and a plurality of generally radially arranged projecting lens sets, surrounding said light-source, a tape printer, a tape puller for advancing the tape from the printer to the projector and completely around the light source, across the axes, of the respective lens sets, and control means for the puller actuated by a tape loop between the printer and the projector, said tape-printer, tape-puller and control-

ling means being disposed near each other between the axes of two adjacent lens sets, whereby they are readily accessible without interference with the operation of said projector.

5 6. In combination, a multiple projector including a light source, and a plurality of generally radially arranged projecting lens sets, a tape printer capable of marking a tape with repetitious or different markings under the control of
10 an operator, a tape puller for advancing the tape from the printer to the projector and across the axes of the respective lens sets, control means for the puller actuated by a tape loop between the printer and the projector, a projecting compartment in which the projector is located, and a plu-
15 rality of translucent screens arranged in apertures in side walls of the compartment, each screen being in front of one of the lens sets and substantially perpendicular to the light beam therefrom.

20 7. In combination, a multiple projector including a light source, and a plurality of generally radially arranged projecting lens sets, a tape printer capable of marking a tape with repetitious or different markings under the control of
25 an operator, a tape puller for advancing the tape from the printer to the projector and across the axes of the respective lens sets, control means for the puller actuated by a tape loop between the printer and the projector, a projecting compart-
30 ment in which the projector is located, a plurality of translucent screens arranged in apertures in side walls of the compartment, each screen being in front of one of the lens sets and substan-
35 tially perpendicular to the light beam therefrom, one of the screens being substantially perpendicular to the light beam from one of the lens sets, but out of alignment with the projecting axis, and angular mirrors intermediate the corresponding lens set and the screen to receive the beams from
40 the lens set and direct it to the screen.

8. Tape printing and multiple projecting mechanism comprising a projector including a light source, a housing therefor having a plurality of light apertures, a plurality of lens sets on the
45 housing in generally radial arrangement, one of said apertures corresponding to each lens set, and means for directing a printed tape about the housing and over the successive apertures, a tape printer, and a tape puller adjacent to said tape-
50 printer and serving for advancing the tape in the stated course from the printer, substantially around the entire periphery of the housing.

9. Tape printing and multiple projecting mechanism comprising a projector including a light
55 source, a housing therefor having a plurality of light apertures, a plurality of lens sets on the housing in generally radial arrangement, one of said apertures corresponding to each lens set, means for directing a printed tape in a path sub-
60 stantially surrounding the periphery of the housing and over the successive apertures, a tape printer, a tape puller for advancing the tape in the stated course from the printer, and puller control means guided by a portion of the tape be-
65 tween the printer and the projector, said tape-printer, tape-puller and controlling means being disposed near each other between the axes of two adjacent lens sets, whereby they are readily ac-
70 cessible without interference with the operation of said projector.

10. Tape printing and multiple projecting mechanism comprising a projector including a light source, a housing therefor having a plu-
75 rality of light apertures, a plurality of lens sets on the housing in generally radial arrangement, one

of said apertures corresponding to each lens set, and means for directing a printed tape about the housing and over the successive apertures, a tape printer, a tape puller for advancing the tape in the stated course from the printer, the printer
5 being arranged to deliver the tape substantially in a horizontal plane with printed side up, and guide means between the printer and the projector and arranged to produce a one-quarter twist in the tape which thereupon passes the project-
10 ing apertures with the printed characters on the outer face and inverted.

11. Tape printing and multiple projecting mechanism comprising a projector including a light source, a housing therefor having a plu-
15 rality of light apertures, a plurality of lens sets on the housing in generally radial arrangement, one of said apertures corresponding to each lens set, means for directing a printed tape about the housing and over the successive apertures, the
20 printer being located in a diagonal position in relation to the projector and close to the first light aperture thereof, and means directing a short stretch of the tape between the printer and the projector with a one-quarter twist therein.
25

12. Tape printing and multiple projecting mechanism comprising a projector including a light source, a housing therefor having a plu-
rality of light apertures, four lens sets on the housing in generally radial arrangement, and
30 adapted to project light-beams in the four cardinal directions, one of said apertures corresponding to each lens set, means for directing a printed tape about the housing and over the suc-
35 cessive apertures, a tape printer, a tape puller adjacent to the printer, and serving to draw the tape in the stated course around the housing from the printer, a follower on a loop portion of the tape between the printer and the projector, and means controlled by the follower for controlling
40 actuation of the tape puller in accordance with the action or rate of action of the printer.

13. Tape printing and multiple projecting mechanism comprising a projector including a light source, a housing therefor having a plu-
45 rality of light apertures, four lens sets on the housing in generally radial arrangement, and arranged to project light-beams in the four cardinal directions, one of said apertures corre-
50 sponding to each lens set, means for directing a printed tape about the housing and over the suc-
55 cessive apertures, a tape printer, a tape puller adjacent to the tape-printer and serving to draw the tape in the stated course around the housing from the printer, a follower on a loop portion of the tape between the printer and the projector, a switch for controlling the tape puller, and means for controlling the switch and actuated by said
60 follower.

14. Tape printing and multiple projecting
60 mechanism comprising a projector proper including a housing, a lamp therein, a plurality of generally radially arranged lens sets on the hous-
65 ing, the housing having a light aperture for each lens set, means for guiding a tape about the hous-
ing and over the respective light apertures, a tape printer adjacent the housing, and a tape puller adjacent the printer and arranged to pull the tape about the housing and over the apertures.
70

15. Tape printing and multiple projecting mechanism comprising a projector proper includ-
75 ing a housing, a lamp therein, a plurality of generally radially arranged lens sets on the hous-
ing, the housing having a light aperture for each

lens set, means for guiding a tape about the housing and over the respective light apertures, a tape printer adjacent the housing, and a tape puller adjacent the printer and arranged to pull the tape about the housing and over the apertures, and puller control means actuated by a portion of the tape between the printer and the projector.

16. Tape printing and multiple projecting mechanism comprising a plurality of generally radially arranged lens sets in a closed endless row, there being a light aperture for each lens set, means for guiding a tape across said light apertures, a tape printer adjacent to and between two successive lens sets, and a tape puller adjacent the printer and arranged to pull the tape successively across said light apertures.

17. Tape printing and multiple projecting mechanism comprising a plurality of generally radially arranged lens sets in a closed endless row, there being a light aperture for each lens set, means for guiding a tape across said light apertures, a tape printer adjacent a tape puller arranged to pull the tape successively across said light apertures, the printer and tape puller being adjacent to one another and between two successive lens sets, and means for directing light

rays radially outward through said light apertures.

18. Tape printing and multiple projecting mechanism comprising a plurality of generally radially arranged lens sets, there being a light aperture for each lens set, means for guiding a tape across said light apertures, a tape printer adjacent said lens sets, a tape puller adjacent the printer and arranged to pull the tape successively across said light apertures, and means including a lamp having a filament arranged in a plurality of grids, one for each of said light apertures to direct the light rays radially outward through said light apertures.

19. Tape printing and multiple projecting mechanism comprising a plurality of generally radially arranged lens sets, there being a light aperture for each lens set, a tape printer for supplying marked tape, means for guiding the tape so supplied across said light apertures, a tape puller for pulling the tape successively across said light apertures, and means including a lamp having a filament arranged in a plurality of grids, one for each of said light apertures to direct the light rays radially outward through said light apertures.

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