

May 29, 1951

L. J. A. LE GOFF
INDICATING SYSTEM

2,554,580

Filed March 13, 1947

4 Sheets-Sheet 1

FIG 1

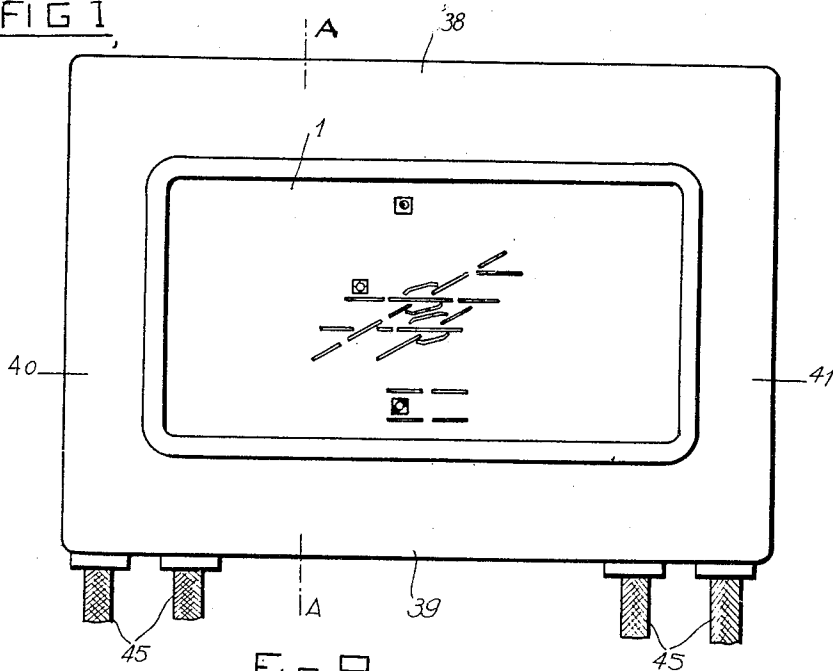
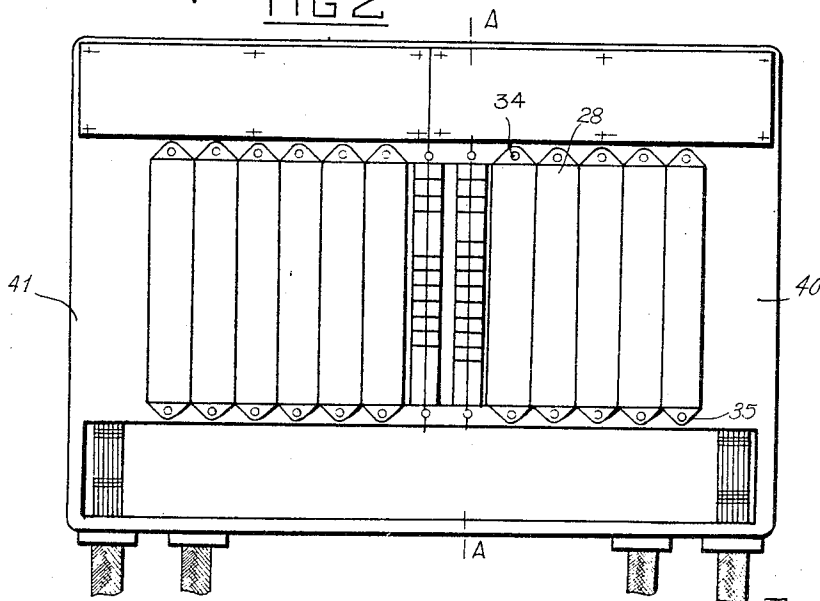


FIG 2



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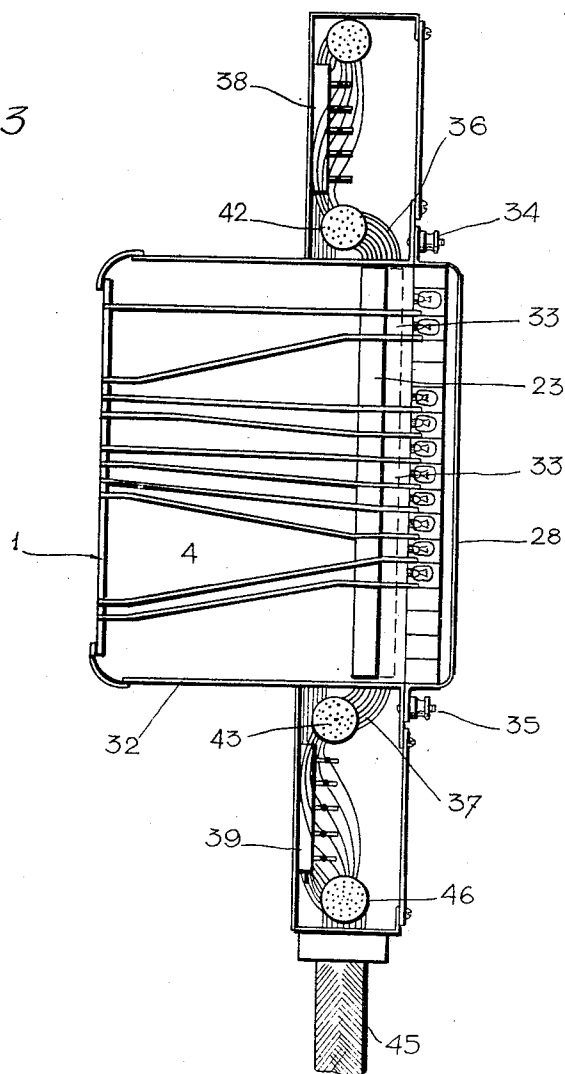
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Fig 3



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Fig. 4.

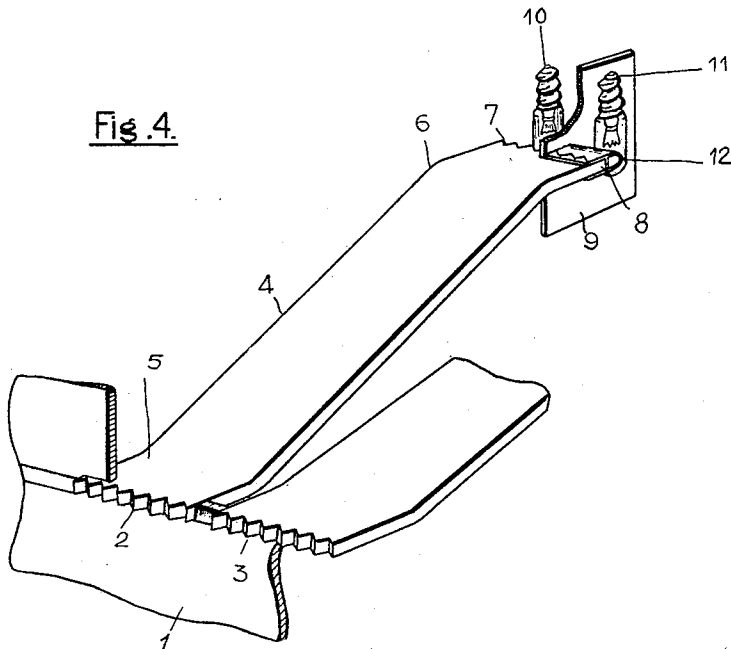
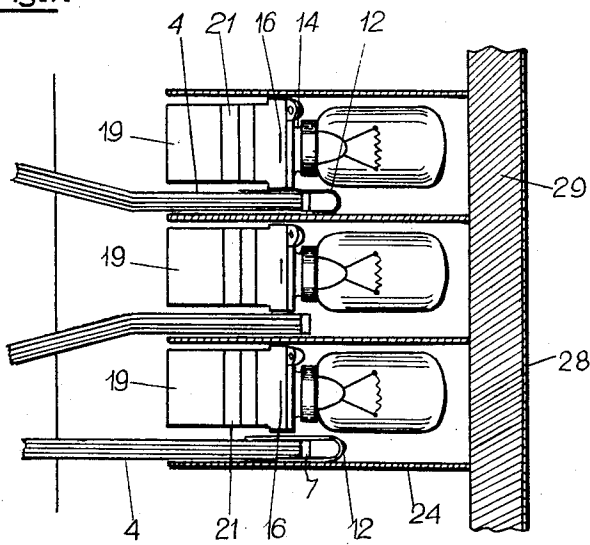


Fig. 7.



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Fig 5

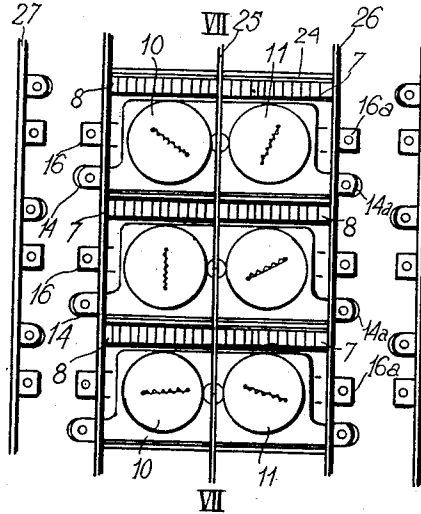


Fig. 6.

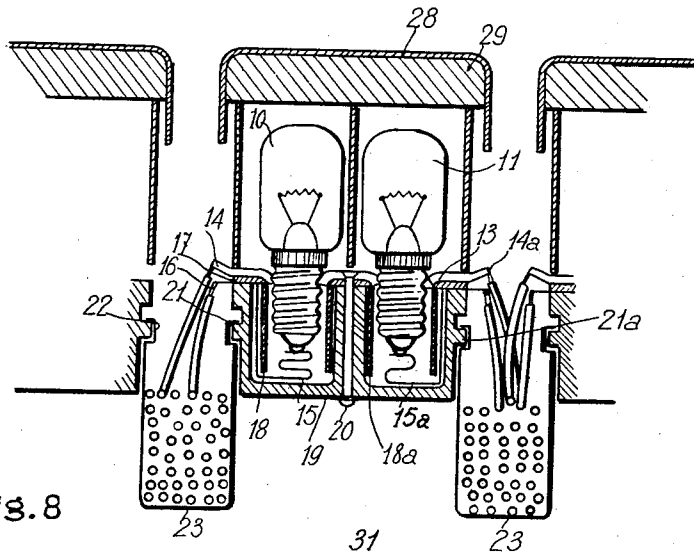
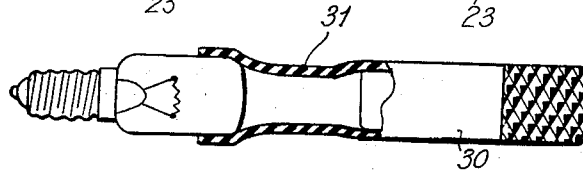


Fig. 8



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UNITED STATES PATENT OFFICE

2,554,580

INDICATING SYSTEM

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2 Claims. (Cl. 177—311)

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According to known methods the variable positions or characteristics of apparatus controlled from a distance through any suitable means as in a railway system are conventionally illustrated on a sketch or diagram. The diagram depicts the whole or a predetermined part of the system by means of electrically lighted signals.

In the existing apparatus, the sizes of the control diagrams are limited by the size of the luminous sources and of their support, which are to be associated with a diagram board having the figuration of the system. The linear and geographical distribution appearing frequently, chiefly as concerns railroad signalling systems, leads to very large sizes with the light sources now in use. There is thus a lack of proportion between the size of the control diagram and that of the board.

The improved arrangement according to this invention allows executing control diagrams of very reduced sizes in keeping with the control boards carrying small levers or knobs. At the same time the invention permits using luminous sources of a size consistent with an easy execution and a normal life for the device.

In the arrangement according to the invention, the luminous sources are grouped at regular spacings which are independent of the diagrammatic distribution of the controlled apparatus, the connection between the sources and the luminous strips or points of the diagram being obtained through light guiding members.

The invention is still further characterized by:

The general arrangement of the control apparatus

The arrangement of the light guiding means

The arrangement of the passages or sheaths grouping the electric wires

The arrangement of the luminous sources and the association of two or more thereof with the interposition of colored filters for giving the luminous point of the diaphragm a uniform variable aspect through the darkening or lightening as the different colors appear in succession or in superposition

The arrangement of the lamp carriers and the means for dismantling same.

Accompanying drawings show by way of example various embodiments of the invention. In said drawings:

Fig. 1 is a front view of an apparatus executed in conformity with the invention.

Fig. 2 is a rear view of said apparatus of which two lamp covers have been removed.

Fig. 3 is a vertical transverse section at a larger scale.

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Fig. 4 is a perspective view of an element including the light guiding source and the luminous signal.

Fig. 5 is an elevational view of a group of lamps seen through their end.

Fig. 6 is a plan view corresponding to Fig. 5.

Fig. 7 is a cross-section through line VII—VII of Fig. 5.

Fig. 8 is a diagrammatic view of the special lamp mounting and dismantling wrench, the lamps being located inside deep recesses.

In the drawings, 1 designates the front of a diagrammatic board formed of a hard opaque material and which may be of any kind, metallic or otherwise; D designates the outline of the apparatus to be controlled such as switches, signals, railroads. Certain stationary elements are painted on the metal sheet or like board and the light elements pass through the front of the apparatus as disclosed hereinafter. These luminous elements are either separate or juxtaposed for producing continuity in the appearance so as to form a luminous band. To this purpose and within the scope of the invention the front wall is provided with suitably shaped openings inside which appear the ends of the light guiding means such as 4 which establish an optic continuity between the signals located and distributed geographically over the front wall and the corresponding light sources 10 distributed regularly over the rear surface. In the case of Fig. 4, the train is represented by the ends 2 and 3 of two linear elements corresponding each to a portion of the railroad track. Each element should show various aspects corresponding to different cases of control.

1. An obscure signal corresponds to the case where the track does not form part of a drawn route.

2. A signal illuminated in white corresponds to the case of the drawn route free for circulation.

3. A signal illuminated in red corresponds to the case of a drawn route already obstructed by a circulating vehicle.

The openings in the front wall shown in Figure 4 allow the ends 2 and 3 of the strips 4 guiding the light to appear. The strips are made of a colourless transparent material shaped with suitable radii of curvature at 5 and at 6 so that the ends of the strip are directed normally with reference to the plane of the front of the apparatus. The other end of the light guiding strip may be subdivided into two parts 7 and 8 by a slot in which is engaged an opaque partition 9. On either side of the partition may be located

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the incandescent sources of light 10 and 11. Between the source 11 and the end of the light guiding member is provided a colored filter 12 surrounding the end part 8 for instance.

Partitions (not illustrated in Figure 4) enclose the sources 10 and 11 and prevent their luminous fluxes from reaching the adjacent elements. The energizing of the source 10 causes a luminous flux to enter the light guiding member 4 which produces the illumination in white of the visible signal 2. The energizing of the source 11 causes a luminous flux colored in red by the filter 12 to enter the light conducting member and produces the illumination in red of the visible signal 2.

The luminous fluxes from the sources 10 and 11 are improved by using suitable diffusing or reflecting surfaces which form the walls of the partitioning system. Suitably shaped striations at 7 and 8 allow using to the utmost a luminous flux for constraining it to enter the light guiding member, a ground surface being also possible for this purpose.

Similarly the visibility of the signal 2 is ensured in all angular directions by a suitable system of striations or ground surfaces at the terminal edge of the corresponding light guiding member.

The light guiding member is made of a material which is but little light-absorbent, such as glass or certain plastic materials. The guiding of the luminous flux is ensured through successive reflections on the surfaces. To this purpose two arrangements are contemplated. In the first case the surfaces are left with their original polish and the guiding of the luminous flux is ensured through total reflection. In this case the light conducting member is surrounded by an opaque sheath shielding it from the adjacent elements. In the second case, the surfaces receive a suitable reflecting metallic coating of silver or aluminium for instance through any usual method, said coating being protected in its turn by a suitable varnish.

Certain of the signals may operate only through the darkening and lightening in a single color. In that case a single luminous source is provided at the inner end of the light conducting member.

The number of light sources is not limited to two. The inner end of the light guiding member may be submitted to the action of a plurality of lamps with different colored filters. Such lamps may be energized in succession or simultaneously if it is desired to obtain a color for the signal, corresponding to the mixture of two or more colors.

A common luminous source or even a group of luminous sources may act simultaneously on a plurality of light guiding members, the inner edges of which are suitably distributed around the luminous foci. This arrangement allows the simultaneous illumination of a plurality of signals distributed in any manner on the diagram, starting from a common source of suitable power.

The visible signal may of course assume different shapes according to the cross section of the light conducting member and to the shaping of its end. It is possible in particular, starting from a strip, to obtain rectilinear or incurved signals or again luminous points through the spiral winding of the end of the strip or its shaping through upsetting for instance.

Figures 2, 3 and 4 illustrate the mounting of the lamp carriers, the arrangement of the ends of the light conducting members, the partitioning

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between the lamps and the arrangement of the conductor sheaths.

By way of example, the drawings illustrate the lamps associated in pairs on a common lamp carrier.

As shown in Fig. 6, the light sources 10 and 11 may be small incandescent bulbs with screw bases which can be screwed into holes in a socket plate 13, said plate having extensions 14 and 14a to which are welded one of the current feeding leads. Contact with the central contact button of the lamp base is provided through coiled spring blades 15 and 15a that have extensions or tail-pieces 16 and 16a to which the second lead is welded.

Insulation between the socket plate 13 and the center contact strips is ensured on one hand by the insulating plate 17 and on the other hand by the individual insulating sleeves or tubes 18 and 18a around the screw portion of the lamp bases. The different socket and insulating plates are secured to the insulating block 19 by a rivet 20.

The electric wires or conductors are located in a U-shaped channel or sheath. The top edges of the channel are folded to form grooves 22 to receive ribs 21, 21a formed on the sides of the insulating blocks 19.

As seen in Fig. 7, inner ends 7 and 8 of the light guiding members 4 which are parallel with the surfaces of the lamp-carrying blocks extend up to the level of the lower end of the largest part of the bulb at which is located the terminal surface which is striated or ground. A colored filter 12 obtained through the folding of a strip surrounds the end 7 or 8 of the light guiding member.

Transverse partitions 24 passing between the different lamp-carrying blocks and held by the folded edge 22 of the sheath 23 carry in their turn the longitudinal partitions 25, 26 and 27 (Fig. 3) located between the lamps of each block and on the outside of the latter. A diffusing or reflecting coat is arranged over the partitioning surfaces.

A cover 28 with a fluid tight cushion 29 ensures the closing of the lamp-carrying recesses, the inner surface of the cushion being also provided with a diffusing or reflecting coat.

Insertion and removal of the lamps from the deep and narrow recesses is facilitated by the use of a special wrench having a handle 30 in the form of a rubber tube 31 the inner diameter of which is smaller than the diameter of the enlarged portion of the lamps. The introduction of the tube over the bulbs allows taking hold of the latter efficiently so as to unscrew and screw down the latter.

The general arrangement of such a system is shown by way of example in Figures 3 and 7. The whole arrangement is located in a case 32 to the upper and lower walls of which are secured the different sheaths 23. As already disclosed, the sheaths carry in their turn the lamp carriers 33 located side by side, possibly with a gap between them in certain cases. Preferably for furthering the mounting, the lamp-carriers correspond to signals located in the same plane, but this arrangement is not to be considered as a limitation and in numerous cases a lamp-carrier may correspond to a signal located to the front or to the rear of its transverse plane.

The partitioning between the lamps is completed by a cover 28 with an inner fluid-tight cushion 29. The cover is arranged so as to correspond to a complete vertical group of lamp-carriers secured at 34 and 35 to the ends of the case.

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The sheaths of the conductors open at their ends 36 and 37 into junction boxes 38 and 39 connected together through vertical elements 40 and 41. The conductors are grouped into strands 42, 43 leading them towards a distributor 44 with terminals arranged preferably in zig-zag formation. On the outside of this distributor are located the ends of the wires 45 connected with the outer apparatuses through the agency of the strands 46.

The above description is by no means limitative and it is only given out so as to allow the principle of my invention to be easily understood, preferably by defining certain details as to shape, arrangement or material. It should be understood that within the scope of the invention, the details should be adapted to each particular case of application which are not limited to the signalling on railroads, but extend to all cases where the control means are grouped inside a small space corresponding to a given zone of action depending if required on a switchboard acting at a distance through a suitable fluid.

What I claim is:

1. Apparatus for an indicating system comprising an indicator board at the front of the apparatus, a bank of electric lamps at the rear of the apparatus, and a plurality of light conductive strips from the board to the bank, said bank comprising blocks of insulating material, a plurality of lamp sockets comprising a conductive plate fixedly mounted in said blocks and having apertures receiving the lamp bases, said lamps facing away from said board to permit mounting and replacement of the lamps into said sockets from

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the rear of the apparatus, said light conductive strips each entering said bank alongside one of said sockets and receiving light from the lamp in the socket without interfering with insertion and removal of the lamp.

2. Apparatus as claimed in claim 1 having partitions between adjacent lamps confining the light from one lamp to its associated light conductive strip, said partitions being spaced from one side of said lamps, and a color filter applied in said space to the ends of certain of said strips and removable from the rear of the apparatus without disturbing said light conductive strips.

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