April 23, 1929. B. ROWNTREE 1,710,192

SIGNALING APPARATUS

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Fig. 1.

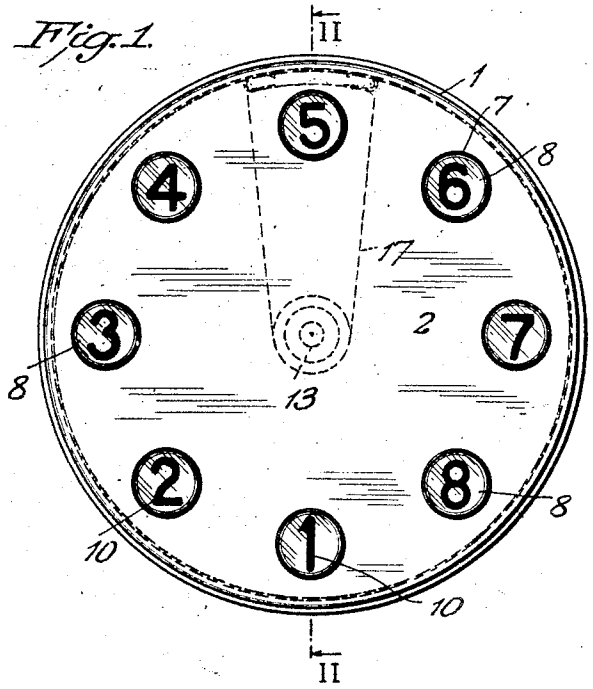


Fig. 2.

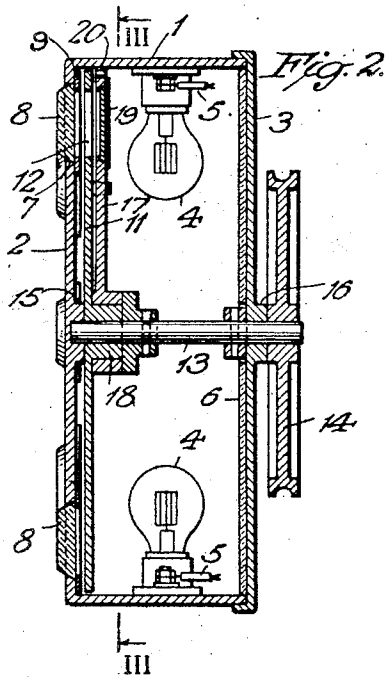
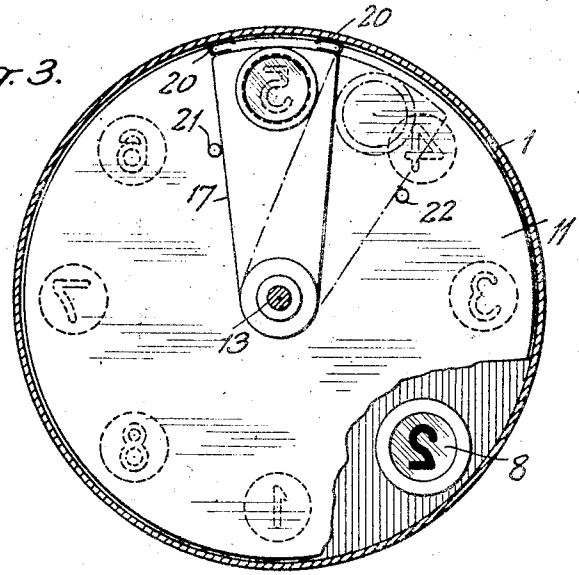


Fig. 3.



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Fig. 4.

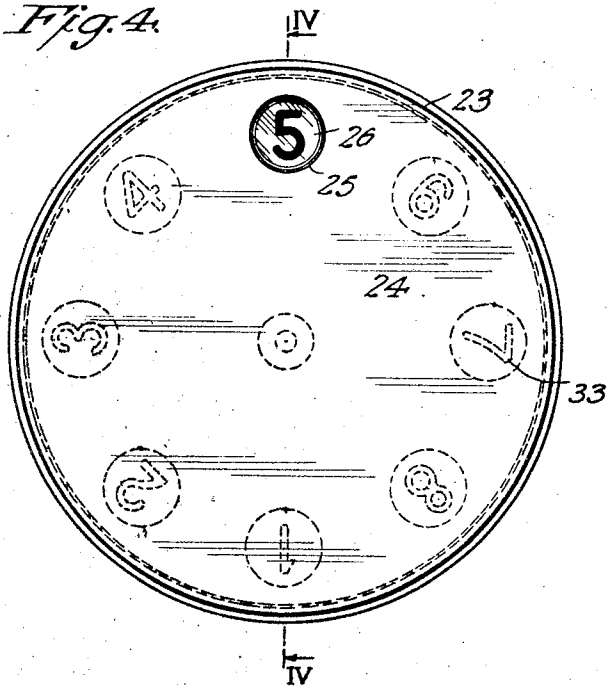


Fig. 5.

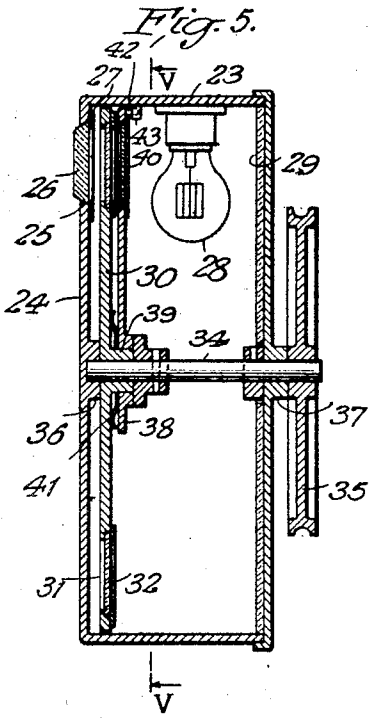
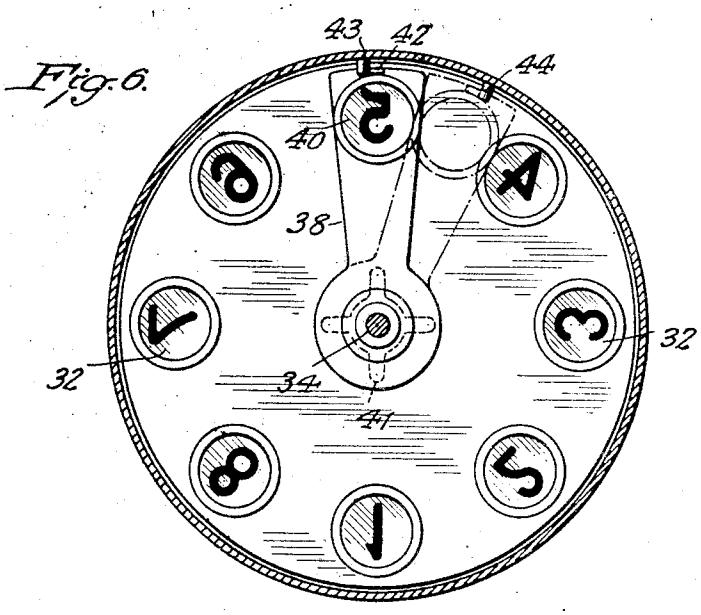


Fig. 6.



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Fig. 7.

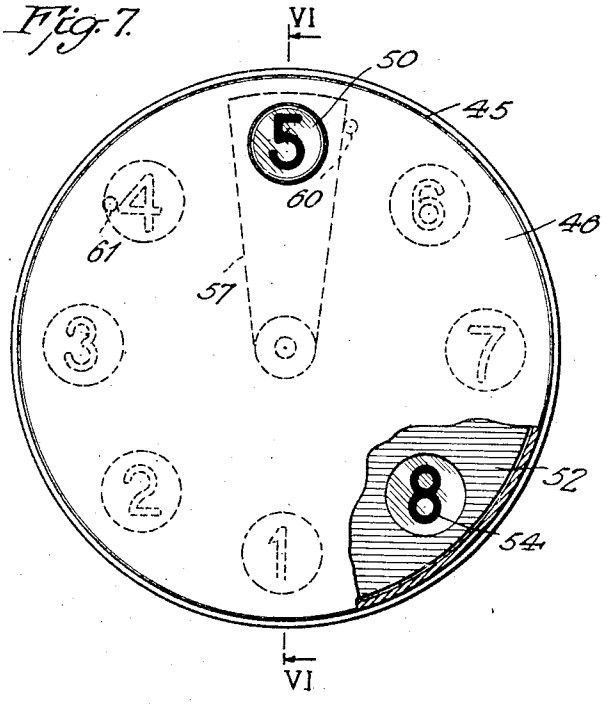


Fig. 8.

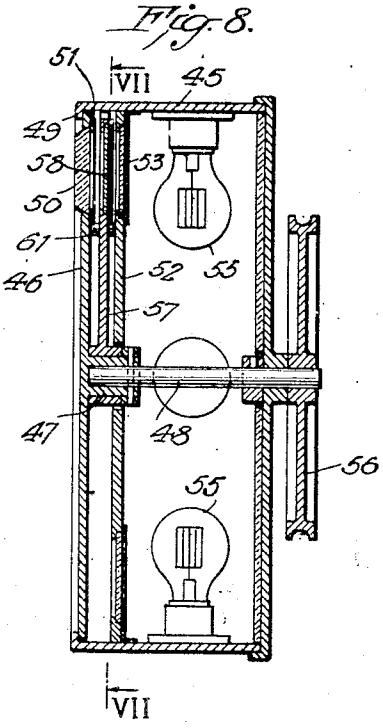
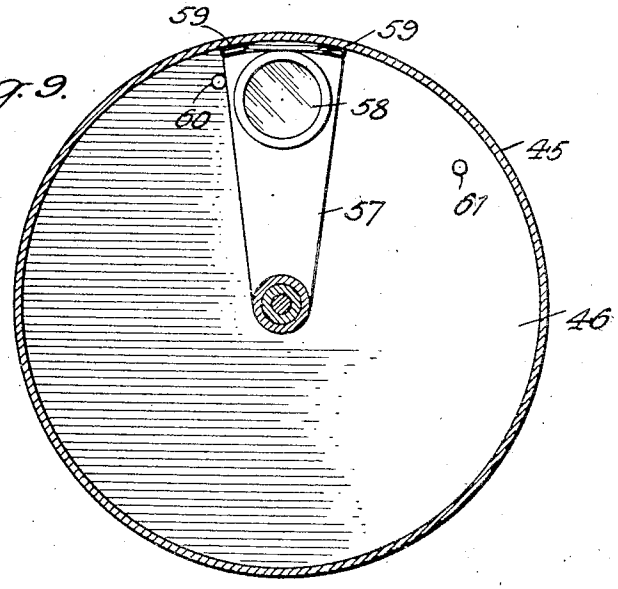


Fig. 9.



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Patented Apr. 23, 1929. 1,710,192

UNITED STATES PATENT OFFICE.

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SIGNALING APPARATUS.

Application filed August 7, 1928. Serial No. 297,967.

My present invention relates to means for indicating the position and direction of travel of elevator cars, transportation devices or carriers, and it is applicable to such devices whether they move vertically as in the case of elevator cars or whether they move horizontally as in the case of trains or other horizontal carriers running on tracks or ways.

In the usual type of elevator signalling device now employed on the floors of a building other than the main floor, a white light indicates that the elevator is rising and a red light indicates that the elevator is descending. It is customary to cause such lights to show when the elevator is a few floors away from the door at which the signal is located. When the lights are not turned on there is no convenient way to determine whether the elevator is below a particular floor. In the present device, means are provided to indicate the floor location and the direction of travel of the elevator at all times.

By providing means of such construction that they will readily attract the attention of the persons waiting for the elevator, passengers will have ample opportunity to be near the elevator door when the car reaches their floor. Thus the "loading" time for the elevator will be considerably reduced and the efficiency of the elevator service correspondingly increased.

The principal object of the present invention is to provide visible means for indicating the position, as well as the direction, of travel of moving cars or other carriers, which means are operated in synchronism with the movement of such devices.

A further object of the invention is to provide means for illuminating a numeral or other indicator when the car or carrier is in the position represented by such indicator.

A further object of the invention is to provide means for illuminating the position-indicator with a particular color to designate in which direction the car or carrier is moving.

A further object is to provide a signalling device of simple, compact and reliable mechanical construction which may be readily installed, repaired and inspected.

A still further object is to provide a signalling device of such form that it may be artistically decorated so as to be in harmony with the surroundings of the building or other structure in which the device may be used.

Further objects of the invention will appear from the following description from which the nature of the invention will be more fully understood when taken in connection with the drawings in which—

Fig. 1 is a side elevational view of a device embodying the invention showing the outer face of the device upon which the position indicating numerals appear,

Fig. 2 is a cross-sectional view of the device taken substantially on the line II—II of Fig. 1 showing the construction thereof, including a plurality of electric bulbs used to illuminate the numerals,

Fig. 3 is a cross-sectional view taken substantially on the line III—III of Fig. 2,

Fig. 4 is a side elevational view of a modification of the device in which the position-indicating numerals are located on a rotatable disk,

Fig. 5 is a cross-sectional view taken substantially on the line IV—IV of Fig. 4,

Fig. 6 is a cross-sectional view taken substantially on the line V—V of Fig. 5,

Fig. 7 is a side elevational view of another modification of the device in which the outer face thereof rotates so as to uncover the position-indicating numerals which are located on a fixed disk,

Fig. 8 is a cross-sectional view taken substantially on the line VI—VI of Fig. 7, and

Fig. 9 is a cross-sectional view taken substantially on the line VII—VII of Fig. 8.

It will be readily appreciated by one skilled in the art to which this invention relates that the invention may be used in conjunction with trains or other carriers moving horizontally on tracks or ways, as well as in conjunction with elevators. Therefore in the following description, although the apparatus is described as being applied particularly to elevators for the purpose of simplifying the description, it is not to be construed in a limiting sense.

Referring to the form of the invention illustrated in Figs. 1 to 3 inclusive, it will be observed that the device comprises a substantially enclosed outer structure formed by a cylindrical casing 1 having a face 2 preferably formed integral therewith, and the back cover 3 which may be, and preferably is, secured to the casing 1 by means well known

in the art and unnecessary to describe herein. The casing 1 may be placed in any desired position with respect to the elevator doors but is most conveniently located above the doors.

Any convenient number of electric light bulbs 4 are positioned within the casing 1 and are normally lighted during the operation of the elevator by a suitable supply of electric current flowing through the leads 5. In order to flood the interior of the casing 1 more completely with light, a mirror 6 or other form of reflector is fastened to the back cover 3.

The front face 2 of the casing is made with a plurality of holes 7 therein arranged in a circular series as shown and corresponding to the number of floors served by the elevator. In the application of the present invention to cars and other carriers which move in a horizontal direction, the number of holes may correspond with track sections or other units of measurement from the position of the signalling device. These holes 7 are preferably so shaped at their edges that disks 8 of glass or other transparent or translucent material may be inserted and removed and also securely held in position. The disks 8 are conveniently held in position by means of the annular washers 9 which are fastened to the interior of the front face 2 as shown more clearly in Fig. 2. The disks 8 are provided with suitable consecutive numerals 10, as shown, or with other characters or symbols painted or otherwise associated therewith which are used to designate the floor level of the elevator.

When the elevator is at a particular floor the numeral corresponding to this floor is illuminated by the light from the bulbs 4 while the remaining numerals are dark. The following construction is employed to accomplish this result. A circular, rotatable disk 11, interposed between the lights 4 and the disks 8, has a single opening 12 which is placed in alignment with the successive disks 8 to illuminate them as the disk 11 is rotated. The disk 11 is keyed or otherwise fastened to the shaft 13 which is driven by the pulley or sheave 14. A cable or other flexible means (not shown) connected with the operating mechanism of the elevator drives the sheave 14 in a well known manner so that the disk 11 will be rotated according to the movement of the elevator upward or downward to cause the illumination of the particular disk 8 which corresponds with the position of the elevator. The shaft 13 is conveniently supported in the bosses 15 and 16, preferably formed integral with the front face 2 and the back 3, respectively.

When the elevator car is ascending, the disks 8 are illuminated by a white light and when the elevator car is descending the disks 8 are illuminated, preferably with a red light, by means of the following construction. A shutter 17 in the form of a sector is rotatably mounted upon the boss 18 formed integral with the disk 11 and carries a piece of red colored glass 19 adapted to be in alignment with the opening 12 when the elevator is descending and to be out of alignment therewith when the elevator is rising. The outer end of the shutter 17 is provided with means for frictional engagement with the inner surface of the casing 1, such as the spring member 20, whereby the shutter will remain fixed in position until moved by a force in excess of the friction exerted by the spring 20. This force is supplied by the studs 21 and 22 which are mounted upon the face of the disk 11 as shown in Fig. 3.

Thus with the shutter 17 in the full line position shown in Fig. 3 and the elevator rising, the shutter will remain in place by virtue of the friction between the spring 20 and the casing 1 while the disk 11 rotates in a counterclockwise direction until the stud 22 contacts with the side of the shutter 17 as shown. As the disk 11 continues to rotate the red glass 19 is not in alignment with the opening 12 so that the white light from the bulbs 4 will illuminate the disks 8 as described above. When the elevator is descending, the disk 11 will rotate with respect to the shutter 17 in a clockwise direction until the stud 21 contacts with the shutter and thereafter the red glass 19 will be in alignment with the opening 12 as it successively passes the disks 8 causing them to be shaded red.

In the modification of the invention shown in Figs. 4 to 6 inclusive, the outer casing 23 is similar in construction to the casing described in connection with the form of the invention shown in Figs. 1 to 3 inclusive. The front face 24 of the casing differs in this modification in that it has a single hole as indicated at 25. A transparent glass disk 26 is inserted within this hole and held in position by means of the annular washer 27. In this modification of the invention a single electric light bulb is preferably positioned within the outer casing 23 as shown so as to be in substantial alignment with the transparent disk 26. A mirror 29 or other form of reflector is employed to flood the interior of the casing 23 with light.

The rotary disk 30 in this modification has a plurality of openings 31 therein corresponding to the number of floors as described above in connection with the first form of the invention described in the specification. These holes are fitted with transparent or translucent glass disks 32 upon which is painted or otherwise associated reference numerals 33 indicating the number of the floor at which the elevator is located at any particular time. The numerals 33 are associated with the disk 32 so that as the disk 30 revolves the numbers may be seen in their normal position

through the transparent glass disk 26 in the outer casing of the device. This positioning of the numbers is clearly shown in Figs. 4 and 6. The disk 30 is keyed or otherwise fastened to the shaft 34 which, as described above, is driven by means of the sheave or pulley 35 which is actuated by the movement of the elevator as previously described. The shaft 34 is rotatably supported by means of the bosses 36 and 37 preferably formed integral with the front and rear faces respectively of the outer casing 23. Thus as the sheave 35 is rotated by the movement of the elevator the disk 30 is caused to rotate so that the numerals 33 appear opposite the disk 26 to indicate the floor level of the elevator.

As described above, when the elevator is rising the numerals 33 are illuminated with a white light and when the elevator is descending the numerals are shaded in red. This coloring of the numerals 33 is accomplished by means of the shutter 38 which is similar in its general construction to the shutter 17 previously described. The shutter 38 is rotatably supported upon the boss 39 which is preferably formed integral with the rotary disk 30. The upper end of the shutter 38 is provided with a red glass disk 40 which, when placed in alignment with the disk 32, causes the numerals 33 to be shaded in red. The positioning of the shutter 38 so that either the white or red light is thrown on the disk 32 is accomplished by means of the following construction. The shutter 38 normally rotates with the disk 30 by virtue of the spring spider 41 which frictionally engages the shutter 38 with this disk. The extreme outer end of the shutter 38 is provided with a projection 42 as shown more clearly in Fig. 6. The inner surface of the outer casing 23 is provided with two spaced projections 43 and 44 with which the projection 42 on the shutter 38 contacts as it rotates with the disk 30. Thus when the elevator is rising and the shutter 38 is initially in the (full line) position shown in Fig. 6 the shutter will be caused to rotate with the disk 30 in a clockwise direction until the projection 42 on the shutter contacts with the projection 44 on the outer casing. The shutter will thereafter be held in the broken line position shown while the disk 30 continues to rotate, causing the numerals 33 to be visible through the transparent disk 26 so as to indicate the floor level of the elevator. Since the shutter with the red glass 40 therein is not in alignment with the numerals 33, they will be illuminated in white, thus indicating that the elevator is rising.

When the elevator is descending, the shutter 38 will be placed in alignment with the numerals 33 in a manner which will be readily understood from the above description. The numerals will, therefore, be shaded in red to indicate that the elevator is descending.

In the modification of the invention shown in Figs. 7 to 9 inclusive, the construction of the outer casing 45 is similar to that described in the other modifications of the invention, but in this instance the front face 46 comprises a rotary disk whose hub 47 is keyed or otherwise fastened to the shaft 48. The outer margin of the rotary disk 46 is supported by the flanges 49 preferably formed integral with the outer casing 45. The rotary disk 46 has a single opening with tapered sides into which is inserted a transparent glass disk 50 held in position by means of the annular washer 51. The disk 52 which, in this modification is provided with a plurality of numbered disks 53, is securely fastened to the outer casing 45 as clearly illustrated in Fig. 8. The numerals 54 are associated with the disks 53 as described above. The means for illuminating the numerals preferably consist of any convenient number of electric light bulbs 55 positioned within the outer casing 45. The numerals 54 are placed in normal position upon the disk 53 so that as the disk 46 rotates the numerals are clearly visible through the transparent glass disk 50. As described in connection with the other modifications of the invention, the shaft 48 is driven by means of the sheave 56 which is rotated by the movement of the elevator.

The system of red and white lights to denote whether the elevator is descending or rising is also employed in this modification and the shutter which is used to accomplish this result is similar in construction and operation to the shutter described in connection with the modification shown in Figs. 1 to 3 inclusive. The shutter 57 is rotatably supported upon the hub 47 and is provided at its outer end with the red glass disk 58. The outer margin of the shutter 57 is provided with a spring contact 59 which is adapted to engage frictionally the shutter with the outer casing 45 so as to hold the shutter fixed in position until moved by a force in excess of the friction exerted by the spring 59. The rotary disk 46 is provided with studs 60 and 61 which are adapted to move the shutter 57 so that the numerals 54 are illuminated with either a red or white light to denote the direction of travel of the elevator.

A further modification of my invention contemplates the provision of two separate sources of light within the housing, each source of light being of a different color, as, for instance, a number of red globes and a number of white globes alternately arranged around the interior of the casing. This will eliminate the moving shutter element previously disclosed as carrying the red lens. In this embodiment, instead of the aforesaid shutter, an arm will be pivoted upon the drive shaft in a similar manner with a frictional drive somewhat similar to that illus-

trated in Figs. 4, 5, and 6. This arm will carry a bridging contact member and cooperate with adjacent stationary contacts so that as it moves from one position to the other as determined by the direction of rotation of the driving shaft, it will establish an electrical circuit to one or the other of the sources of illumination and preferably so that when the elevator is ascending the white lights will be lighted and when descending the red lights will be lighted.

Having thus described these forms of my invention I wish it to be understood that various changes may be made by those skilled in the art without departing from the spirit and scope of my invention.

Having thus described my invention, what I claim and desire to secure by Letters Patent is—

1. In combination with a travelling carrier, signalling apparatus comprising a series of position indicating elements adapted to be successively illuminated in accordance with the position of the carrier, and means whereby the color of the illumination of said position indicating means will be changed in response to a reversal of the direction of movement of said carrier.

2. In combination with a travelling carrier, signalling apparatus comprising a series of position indicating elements adapted to transmit light therethrough, a source of light located behind said indicating elements, means whereby said light will be successively projected through different indicating elements, and means whereby the color of the light projected through said indicating elements will be changed as determined by the direction of movement of said carrier.

3. In combination with a travelling carrier, signalling apparatus comprising a series of position indicating elements adapted to transmit light and arranged in accordance with the successive positions of said carrier, a movable member adapted to select successively particular elements, and means for varying the color of the illumination of said elements in accordance with the direction of travel of said carrier.

4. In combination with a travelling carrier, signalling apparatus comprising a series of position indicating elements adapted to transmit light and arranged in accordance with the successive positions of said carrier, a movable member adapted to select successively particular elements, movable means for causing said elements to be illuminated with a different colored light, and means for placing said movable means in a desired position relative to said indicating elements.

5. In combination with a travelling carrier, signalling apparatus comprising a series of position indicating elements adapted to transmit light and arranged in accordance with the successive positions of said carrier, a movable member adapted to select successively particular elements, a device for causing said elements to be illuminated with a different colored light, means for moving said device, and means for placing said device in a desired position relative to said indicating elements.

6. In combination with a travelling carrier, signalling apparatus comprising a series of position indicating elements adapted to transmit light and arranged in accordance with the successive positions of said carrier, a rotatable member adapted to select successively particular elements, a device adapted to be oscillated with respect to said elements to cause the same to be illuminated with a different colored light, means for oscillating said device, and means for placing said device in a desired position relative to said indicating elements.

7. In combination with a travelling carrier, signalling apparatus comprising a member having associated therewith a series of position indicating elements adapted to transmit light and arranged in accordance with the successive positions of said carrier, a rotatable disk having an opening therein through which light may pass to illuminate successively said elements, and a member adapted to be placed in alignment with said opening to cause said elements to be illuminated with a different colored light.

8. In combination with a travelling carrier, signalling apparatus comprising a member having associated therewith a series of position indicating elements adapted to transmit light and arranged in accordance with the successive positions of said carrier, a rotatable disk having an opening therein through which light may be passed to illuminate successively said elements, a member adapted to be placed in alignment with said opening to cause said elements to be illuminated with a different colored light, and means for causing the last named member to rotate with said rotatable disk in a particular relation with respect thereto.

9. In combination with a travelling carrier, signalling apparatus comprising a member having associated therewith a series of position indicating elements adapted to transmit light and arranged in accordance with the successive positions of said carrier, a rotatable disk having an opening therein through which light may be passed to illuminate successively said elements, means for rotating said disk whereby said elements are illuminated at predetermined times, a member adapted to be placed in alignment with said opening to cause said elements to be illuminated with a different colored light, and means for causing the last named member to rotate with said rotatable disk in a particular relation with respect thereto.

10. In combination with a travelling car-

rier, signalling apparatus comprising an outer casing, a member forming the front of said casing and having associated therewith a series of position indicating elements adapted to transmit light and arranged in accordance with the successive positions of said carrier, a rotatable disk within said casing and having an opening therein through which light may be passed to illuminate successively said elements at predetermined times, a member adapted to be placed in alignment with said opening to cause said elements to be illuminated with a different colored light, means for frictionally engaging the last named member with said outer casing, and means for causing the last named member to rotate with said rotatable disk in a particular relation with respect thereto.

11. In combination with a travelling carrier, signalling apparatus comprising an outer casing, a member forming the front face of said casing and having a series of openings therein, disks adapted to transmit light and having associated therewith position indicating characters arranged in accordance with the respective positions of said carrier, means for holding said disks in said openings, a rotatable disk within said casing and having an opening therein through which light may pass to illuminate successively said characters at predetermined times, a member having colored glass therein and adapted to be placed in alignment with the last named opening to cause said characters to be illuminated with a different colored light, resilient means for frictionally engaging the last named member with said outer casing, means associated with said rotatable disk for causing the last named member to rotate therewith in a particular relation with said disk, and a source of light within said outer casing.

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