R. L. CAIRNCROSS.

SIGNAL.

APPLICATION FILED SEPT. 8, 1908.

931,382.

Patented Aug. 17, 1909.

3 SHEETS—SHEET 1.

Fig. 1.

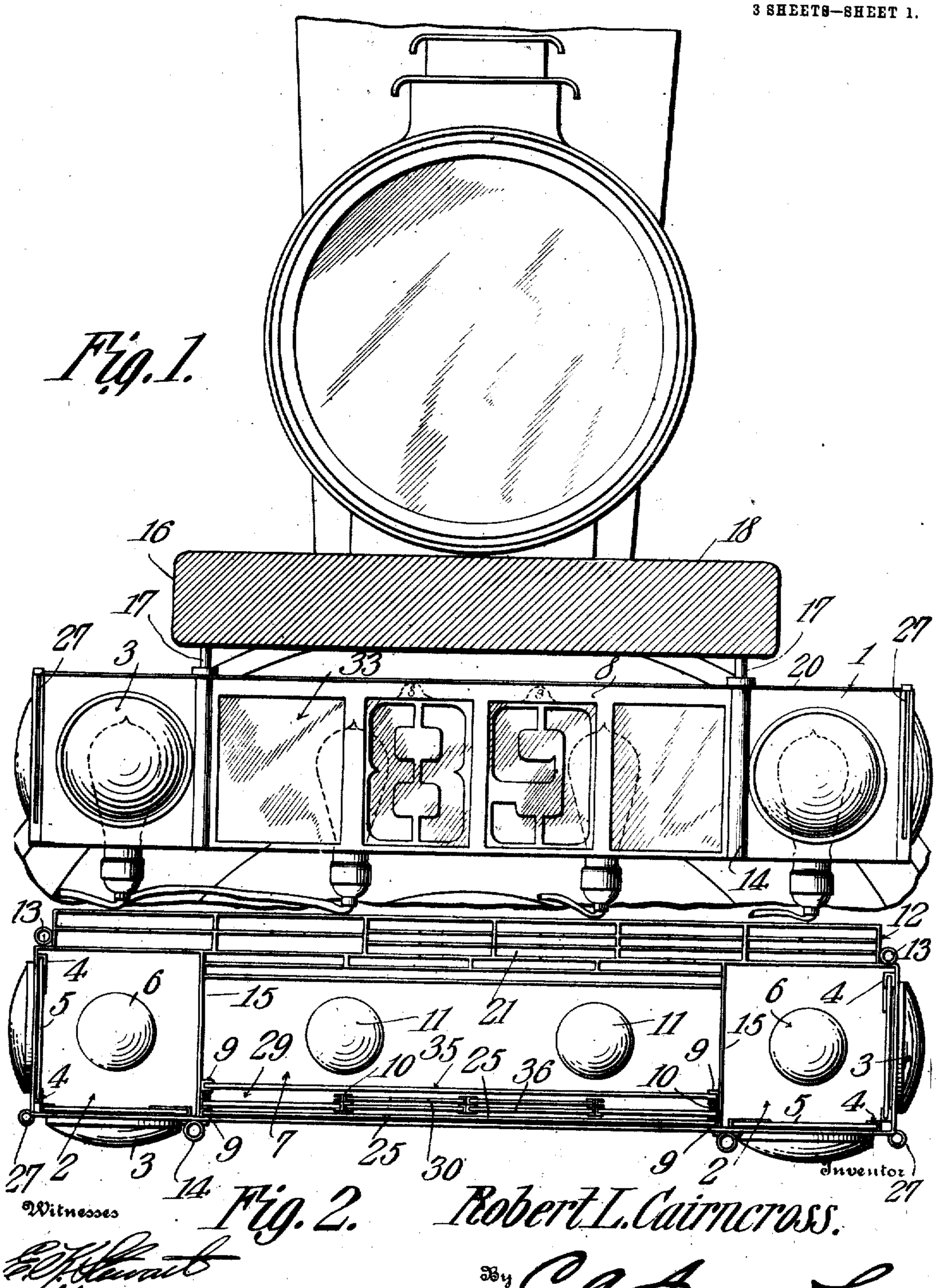

Fig. 2.

Witnesses

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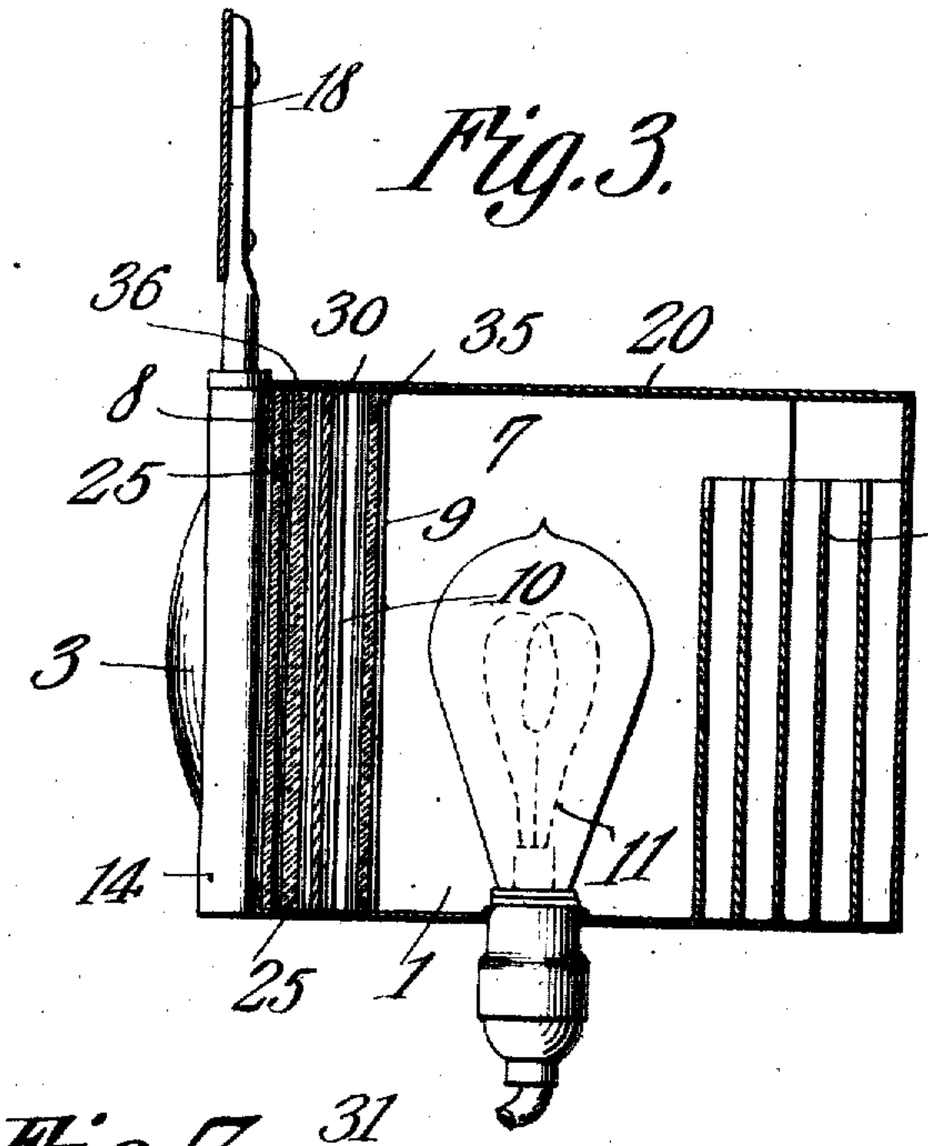
3 SHEETS—SHEET 2.

Fig. 3.



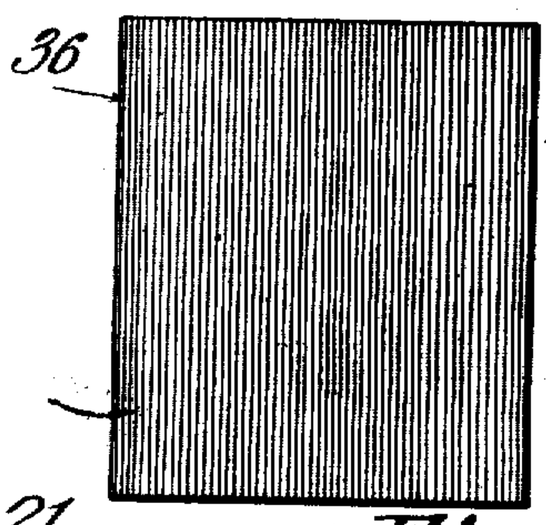


Fig. 5.

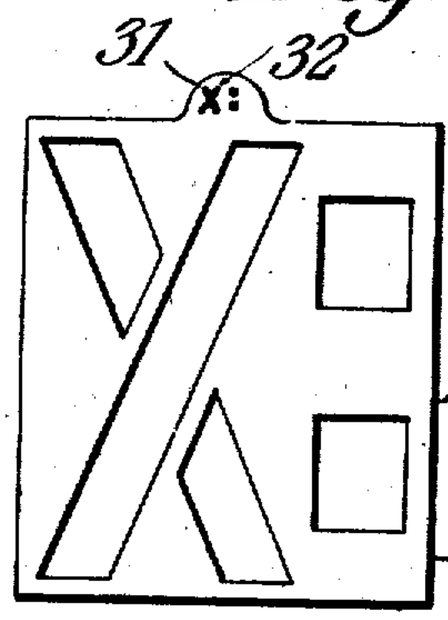


Fig. 6.

Fig. 7.

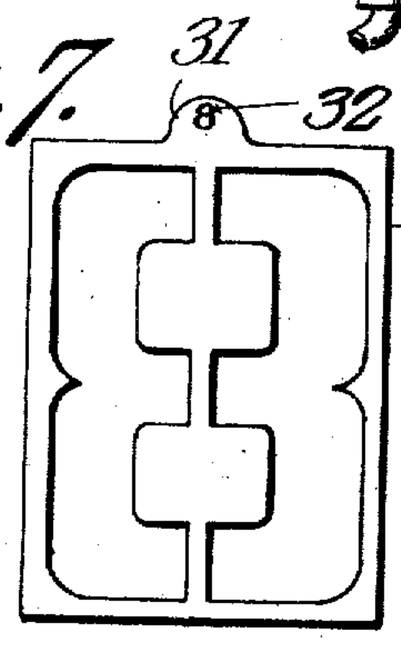


Fig. 4.

Fig. 8.

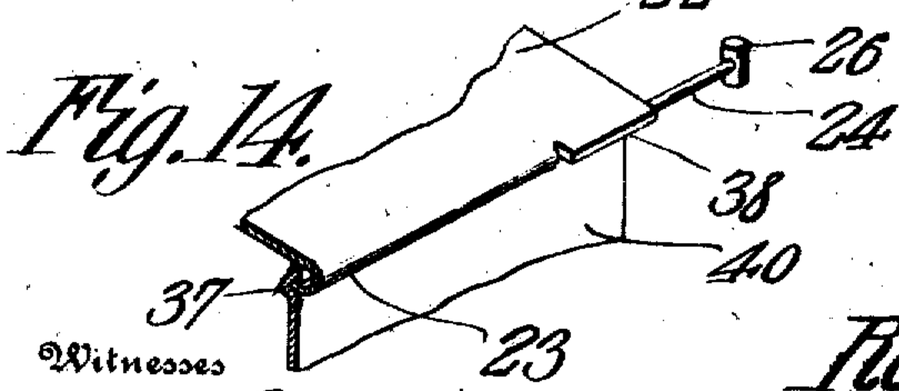


Fig. 14.

Witnesses

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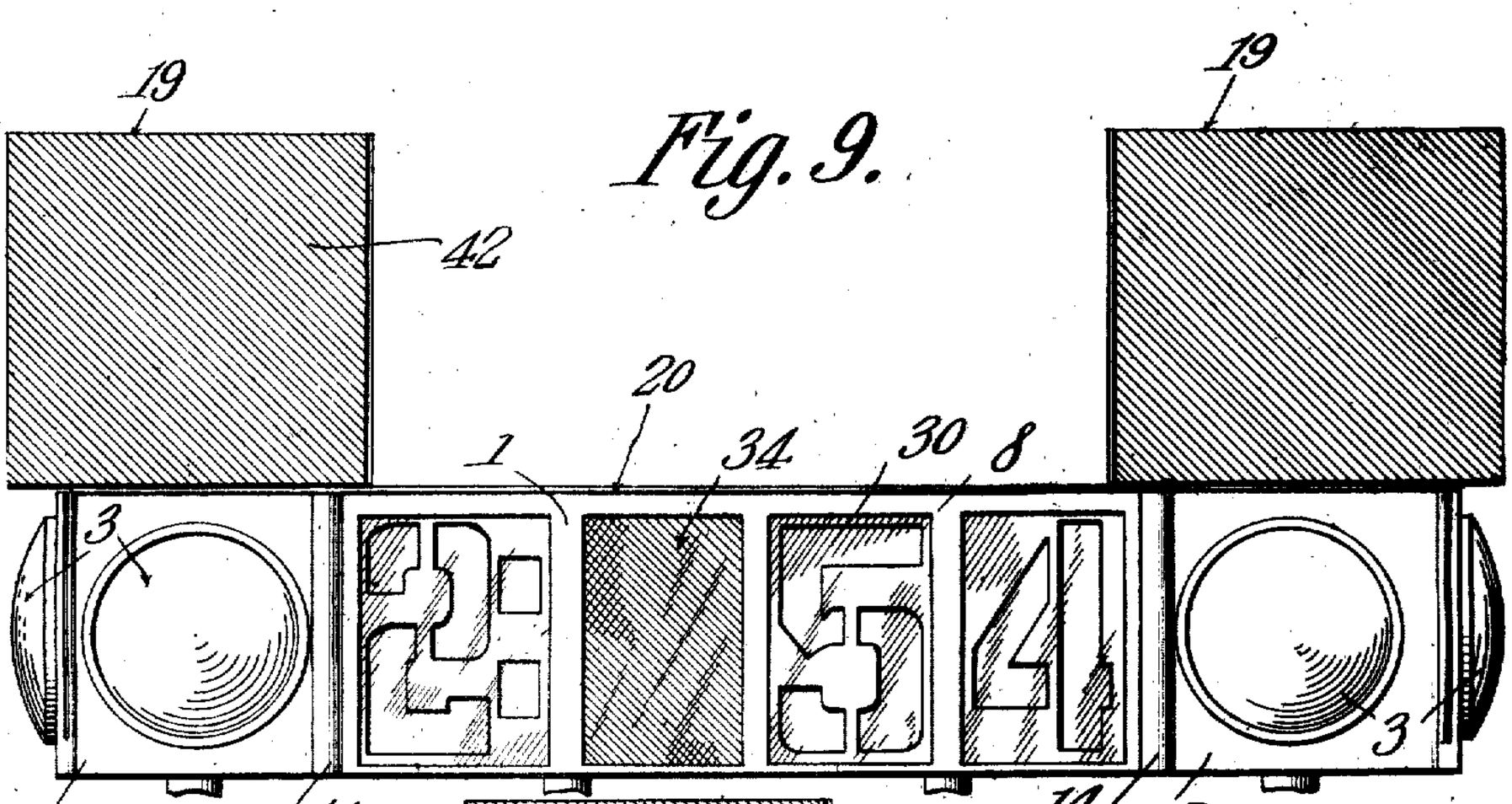
3 SHEETS—SHEET 3.

Fig. 9.



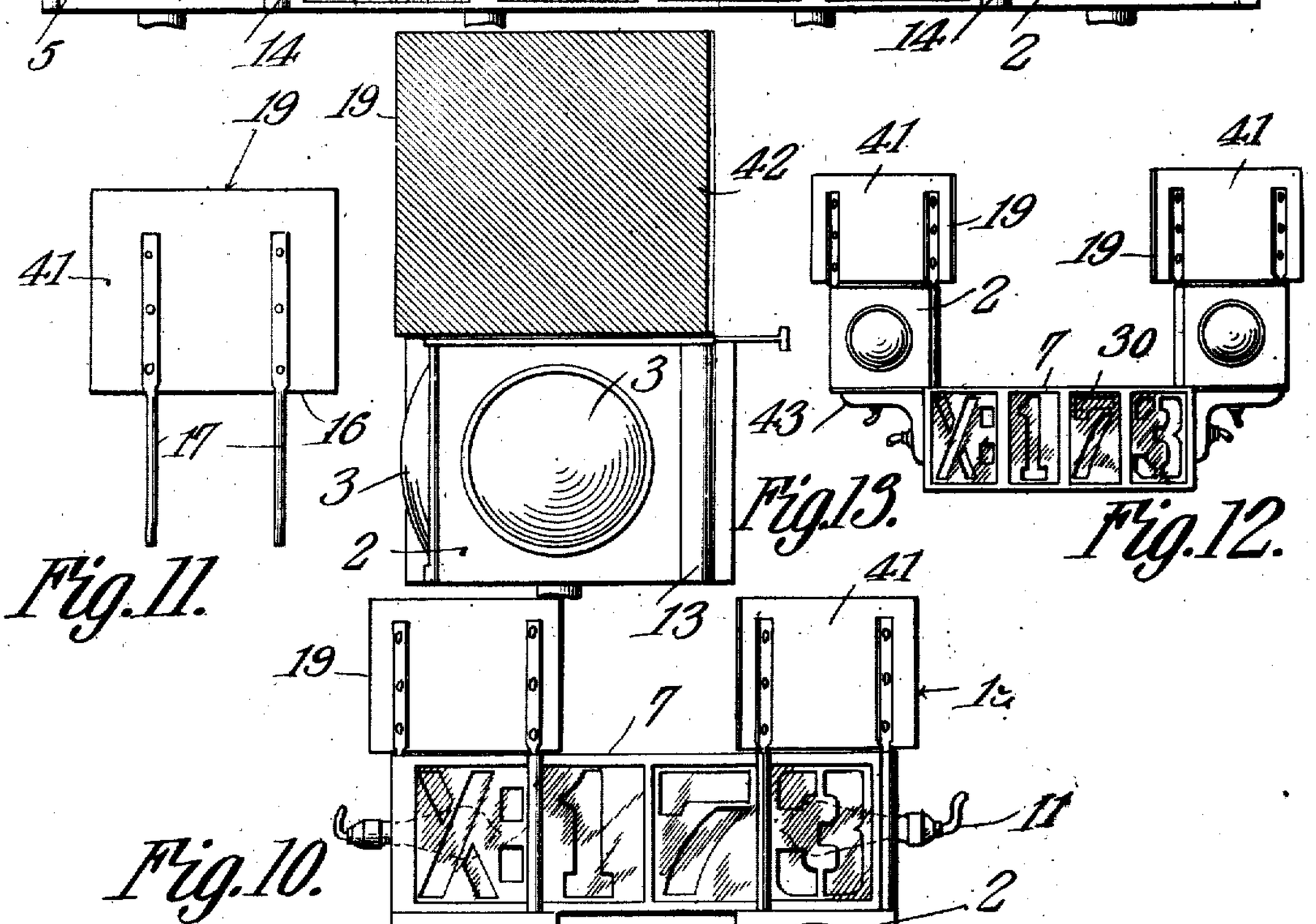


Fig. 11.

Fig. 13.

Fig. 12.

Fig. 10.

Witnesses

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UNITED STATES PATENT OFFICE.

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SIGNAL.

No. 931,382. Specification of Letters Patent. Patented Aug. 17, 1909.

Application filed September 8, 1908. Serial No. 452,030.

To all whom it may concern:

Be it known that I, ROBERT L. CAIRNCROSS, a subject of the King of England, residing at Beaumont, in the county of Jefferson and State of Texas, United States of America, have invented a new and useful Signal, of which the following is a specification.

By way of explanation, I will state that in railroad practice, it is common for trainmasters to send out trains in several parts, technically known as "sections", each section being drawn by one or more locomotives, and constituting, for all intents and purposes, a separate train. Thus, the first section of train number fifty-four would be known as the "first fifty-four", the second section as the "second fifty-four" and so on. Another train, number eighty-nine, for example, scheduled to leave at an hour in close proximity to the time of departure of train number fifty-four, might, in the same manner, be divided up into several sections. To adhere to the concrete example, although the several sections of train fifty-four might be despatched first, some or all of the sections of train eighty-nine might overtake and pass any or all of the sections of train fifty-four.

In orders issued to train crews, it is customary to direct that the train of the recipient wait for, or pass certain train sections at sidings or elsewhere. It will be seen that if accidents are to be avoided, the identity of the train or section must be established beyond doubt. The character of the rolling-stock may serve as a slight index; the time upon which the train is running is of less value; and the sequence of the sections in passing a given point proves nothing at all, for, as hereinbefore pointed out, the "second eighty-nine" may have passed the "second fifty-four" upon the road.

In the foregoing, I have purposely selected a simple case; that of two trains of several sections running in the same direction. It will be seen that, when in addition to those above mentioned, there are other trains, each of several sections, the second trains running in a direction opposite to the first, the situation is even more complicated, and the danger of accident far greater. This inability of train men to distinguish what train they have met or been passed by has led to frequent accidents, and it is the object of this invention to provide, in an inexpensive form, a simple device, by which, either in daylight or after night-fall, the character of a train may be determined to a certainty, without change or alternation between daylight and night signals, except for the simple matter of lighting or extinguishing the lamps; whether it be freight or passenger, regular or extra, and the particular section which may be represented.

For years trainmen have been demanding a signal which will show the last or only section of a regular train, and, so far as I am advised as to the state of the art, no such signal has ever been devised or used by railroad companies, and a device adapted to that end forms the subject matter of this specification.

With these objects in view, together with others, which a perusal of this specification will reveal to those skilled in the art, the invention consists in the novel construction and arrangement of parts hereinafter described, delineated in the accompanying drawings and particularly pointed out in the appended claims, it being understood that various changes in the form, proportions, size and minor details of the structure may be made within the scope of the appended claims without departing from the spirit or sacrificing any of the advantages of the invention.

Similar numerals of reference are employed to indicate corresponding parts throughout the several figures of the drawings.

In the accompanying drawings:—Figure 1 shows, in front elevation, my invention attached to the front of a locomotive and disposed directly beneath the headlight; Fig. 2 is a top plan of my invention, the lid 20 being removed that the details of the interior of the device may be more readily made manifest; Fig. 3 is a vertical transverse section through the central chamber 7; Fig. 4 is an end elevation; Fig. 5 is a front elevation of one of the colored screens 36; Fig. 6 is a front elevation of one of the stenciled plates 30; Fig. 7 is a front elevation of one of the stenciled plates 30, showing a numeral replacing the conventional sign shown in Fig. 6; Fig. 8 is a top plan, showing in detail upon an enlarged scale, that the construction may more readily appear, the relation between the lid 20 and the housing 1, the lid 20 being withdrawn from

the top of the housing; Fig. 9 is a front elevation, showing a different combination of signals from that delineated in Fig. 1; Fig. 10 shows in front elevation, a modified form of my invention; Fig. 11 shows in rear elevation, one of the day signals 19; Fig. 12 shows in front elevation, a modified form of my invention; Fig. 13 is an end elevation, showing one of the day signals 19 in place; Fig. 14 is a detail perspective intended to delineate the lid 20 and the accessory parts and to show the manner in which the lid is carried by the housing 1.

In carrying out my invention, I provide a housing 1, which may be of any form. Preferably, however, as shown, it is rectangular, and oblong in form. In the ends of the housing 1 are mounted lamp-boxes 2, provided with lenses 3 of the bull's-eye type, disposed in the front and ends of the said lamp-boxes 2. Within the lamp-boxes 2 are guides 4, arranged to receive, removably, colored screens 5, whereby the rays proceeding from the lamps 6, located in the boxes 2, may be tinted. Between the lamp-boxes 2 lies the central chamber 7, having an open front 8. Mounted in the ends of the chamber 7 and near to its front face, are the end guides 9, adapted to receive sheets or plates 25 and 35 of the full length of the front of the chamber 7. Between the end guides 9 are located intermediate guides 10, disposed transversely with respect to the front of the chamber 7, and arranged to divide the front of the chamber 7 into a plurality of similar spaces 29. The guides 9 and 10 may be of any form adapted to receive slidably and to hold removably, flat sheets or plates of the character to be hereinafter described. The chamber 7 is provided in its interior with lights 11. These lights 11 and the lights in the lamp-boxes 2 may be of any form and the medium used may be electricity, as indicated in the accompanying drawings, or it may be oil, acetylene, or other means adapted to the end sought, the lighting of the device being left to the science of illumination and forming no distinctive feature of the invention. If electricity be used, a dynamo of the ordinary train type, together with a battery of storage cells, will furnish sufficient equipment.

The rear of the housing 1 sets inward from the ends, as shown at 12; in the recess thus formed, are mounted sockets 13, tubular in form, and extending substantially to the bottom of the housing 1. Other sockets 14 are disposed upon the front of the housing 1; opposite to, and in substantial alinement with, the partitions 15, which separate the lamp-boxes 2 from the chamber 7.

Day signals are provided, of which there are two sorts, differing, in size and shape, but not in construction. These day signals comprise a flat body 16, from which depend arms 17, adapted to enter the sockets 13 and 14. In one of these day signals 18, the arms 17 are so disposed as to register with the sockets 14. In the other day signal, designated by the numeral 19, the arms 17 are so disposed that one of them may register with one of the sockets 13, and the other arm register with the adjacent socket 14 upon the front of the device, thus disposing the signal 19 in a diagonal line from one of the rear corners of the housing to the front face, as shown in Fig. 9.

The housing 1 is provided with a lid 20, and when the signal 19 is in its place, the body portion 16 of the signal will have its lower edge in contact with the top of the lid 20, holding the said lid firmly in place upon the housing 1. In the interior of the housing 1, extending across its rear face, from end to end, are pockets 21, in which may be kept screens 25, 35 and 36, stenciled plates 30, and like devices, intended to be used in connection with the guides 9 and 10, as will be described hereinafter. The lid 20 may be of any form. It may be simply hinged to the housing 1 in the ordinary manner. In some instances, however, as shown in Fig. 1, it may be desired to place my invention close up beneath the head-light, and, in such case, the head-light or some of its parts would probably interfere with the opening of an ordinary hinged lid. To obviate this difficulty, I have devised a lid of peculiar construction, shown in detail in Figs. 4, 8 and 14. This lid comprises a body portion 22, having down-turned edges 23, arranged to register with the channel 37, which is sunk into the end 40 of the housing 1, extending inward into the said housing. A part of the edge of the body portion 22 is allowed to remain outstanding at the rear of said portion 22, as shown at 38, and this outstanding portion carries a catch 24, terminating in a boss 26. The front corners of the housing 1 carry tubular sockets 27, slotted longitudinally from the top downward, as shown at 28. The tops of the sockets 27 are cut away at the rear, leaving the front portion upstanding to form a shoulder 39. When the lid 20 is pulled forward the downturned edge 23 will traverse the channel 37, the boss 26 moving along the end 40 of the housing 1, and without the said housing. When the boss 26 strikes the shoulder 39, the catches 24 will drop into the slots 28, and the lid 20 will assume the substantially horizontal position shown in dotted line in Fig. 4, where it will remain, leaving the hands of the operator free.

The invention includes an equipment intended to be stored in the pockets 21 when not in use in the guides 9 and 10, and this equipment I will now describe in its preferred form. I provide a number of opaque

plates which may be introduced into the guides 10, to close entirely the open front of the housing 1, and to cut off the light from the lamps 11, these opaque plates being substantially of the same shape as the screens 36; or, if desired, these opaque plates may be used in but one or two of the spaces 29, to serve as opaque blocks between symbols mounted in the remaining spaces 29. I further provide transparent colored screens 36, adapted to be mounted in the guides 10 and to close one or more of the sections 29. In the end guides 9 are mounted glass plates 25 and 35, extending entirely across the open front, the guides 10 lying between these full-length plates. When thus arranged, the full-length plates carried by the end guides 9 serve to protect the plates mounted in the guides 10 against accidental, internal or external injury. The full-length plate 25 mounted in the outer end guides 9 is of plain, clear glass. The full length plate 35 mounted in the inner or rear guides 9, however, is provided with a frosted, or ground surface, the object being to furnish a white back-ground by day for the stenciled plates 30, and to diffuse the light behind them, when the lamps 11 are lighted after night-fall.

Stenciled plates 30 may be mounted in the guides 10, and, if desired, full-length, colored, transparent plates, similar in shape to plates 25 and 35, arranged to be mounted in the end guides 9, may be carried, whereby to give a colored backing for the entire open front 8. The stenciled plates 30 are fashioned from opaque material, and may show any desired characters. I prefer that they should include four sets of figures from 0 to 9, and to these may be added conventional signs, such as "X:" and the like. The stenciled plates 30 are provided with a lip 31, upstanding from the upper edge of the plate as shown in Fig. 6. The large character carried by the body of the plate is duplicated upon the lip 31 in diminished size, as shown in Fig. 7, and designated by the numeral 32. These smaller numerals may be cut entirely through the lip 31 or merely impressed therein. The object of the lip 31 is to furnish a means whereby the stenciled plates 30 may be grasped for removal from the guides 10 or from the pockets 21. The small numerals 32 upon the lip 31 serve a double purpose. First, they furnish a means whereby the plates 30 may be identified when inclosed in the pockets 21; and second, they serve to roughen the surfaces of the lip 31, and to secure thereby a firm finger-hold.

The day signals 18 and 19 may be variously colored. I prefer however that the signal 19 be colored white upon its back 41, and green upon its face 42, and that the signal 18 carry, upon both sides, a distinctive color, preferably purple.

It will be seen that with the above described outfit, embracing the lamps 6, the color of which may be changed by means of the screens 5, the stenciled plates 30, and the colored screens 36, which may be mounted interchangeably with the stenciled plates 30 in the guides 10, and the daylight signals 18 and 19, an endless number of combinations may be made, whereby a broad scope of information relative to the character of the train may be conveyed, a code having been first fixed upon. The possible number of combinations may be still further increased by the fact that there are two sets of the guides 10, one disposed behind the other, so that when the front set is wholly or partially filled with stenciled plates 30, screens 36, of various colors, may be mounted in the rear set, to tint one or more of the numbers indicated by the stenciled plates.

It should be understood that the spaces 29 are of the same size, and that the plates 30 and the screens 36 may be moved interchangeably from space to space.

I will now describe certain of the uses to which my invention may be put. Referring to Fig. 1, which shows my invention in the preferred position upon the front of a locomotive and beneath the headlight, it will be seen that the daylight signal 18 is in position. This signal 18 carrying a distinctive color, as purple, by its shape, position and color, indicates the last or only section of a train, and the stenciled plates show that the particular train is train eighty-nine. When night has fallen and the signal 18 is no longer visible, the lamps 11 are lighted, and the stenciled plates 30 still show the number of the train. Purple, the color carried by the signal 18, is the tint employed to denote the last or only section of a train, and in the spaces 33 are mounted transparent screens bearing this color, thus conveying, even in darkness, the information given by the signal 18 in the daylight.

Referring now to Fig. 9, which illustrates another combination, the daylight signals 19 are shown in place and with their green sides 42 forward. The shape, position and color of these signals indicate that there is another train following the one bearing the signal, and the numerals displayed by the stenciled plates 30 denote that the train upon which the signals are displayed is the second section of train fifty-four. In the space 34 a green, transparent screen is displayed, green being the color carried by the day signal 19, and after night-fall this space 34 conveys the information afforded in daylight by the signal 19, to wit: that there is a train following, the numerals upon the stenciled plates 30 in Fig. 9, illuminated by the lamps 11,

still showing the number of the train bearing them, and the particular section thereof.

In Fig. 12 I have shown a modified form of the invention, wherein the chamber 7 forms the base of the structure, the lamp-boxes 2 being superposed thereon, and carried outward beyond the ends of the chamber, being supported by brackets 43. In this are shown the day signals 19, with the white rear, 41, exposed, and the stencil plates 30 set to denote extra train one hundred and seventy-three, the white rear of the signals 19 denoting such extra train.

In Fig. 10 I have shown a modified form of my invention, wherein the lamp-boxes 2 have been disposed beneath the central chamber 7, the lamps 11 being introduced into the chamber 7 from the ends, and the lamps 6 introduced into the lamp-boxes 2 from beneath.

I have further employed Fig. 10 to illustrate another method of displaying signals. The day signals 19 are employed and display a white surface 41, indicating that the train is an "extra" so called. The stenciled sign "X:" will indicate the character of the train after nightfall, and the stenciled numerals 173 show the number of the train.

It is the present practice to designate extra trains by the number of the engine, which necessitates the addition, in train orders, of words indicating the direction in which the extra is bound. By the use of my invention it would be possible to designate extras by certain numbers, the odd numbers to move in the same direction as the odd numbered regular train and vice versa. Under this arrangement, the engine number would be of no more importance than the caboose number, and the term designating direction of train movement, east, west, or the like, necessary when the extra is designated by engine numbers, could be dispensed with.

At present, there is no set place upon the locomotive where signals are to be carried. They are sometimes carried upon the pilot beam; in other cases upon the sides of the boiler front; in other cases they are disposed upon the sides of the boiler, to the rear of the front and fastened to the running board handle. Likewise, they are often mounted upon or near the headlight, and have a source of illumination in common with the headlight. In addition to the above pointed out uncertainty as to the location of signals, there is no uniformity as to the character of the signals displayed. Many of them being cumberous in form and untrustworthy in operation. In my invention, the signal is adapted to be displayed in a definite place, namely, beneath the headlight, which is the most conspicuous point upon the entire train.

I have pointed out that most of the signal devices used upon locomotives are cumberous in form; in my invention, on the contrary, the devices intended to convey the desired information are united in a compact and rigid form, adapted to be mounted in small compass in the position where they can be most readily and certainly observed.

I have shown and described my invention as provided with four spaces 29, wherein numerals may be exposed, but it is obvious that the number of these spaces 29 may be increased by lengthening the chamber 7, thus providing for the high numerals carried by the locomotives on certain roads.

I have hereinbefore stated that the stenciled plates 30 may be backed by colored glass, but the preferred backing is the full length frosted or ground glass 35, hereinbefore described.

The front of the locomotive may be provided with a horizontally disposed rail, (not shown) in which the hooks of a scaling ladder may be engaged, furnishing a means of ascent to my device, for the purpose of altering signals, cleaning or repairs.

Throughout the above description, definite colors have been designated in an effort to cause my invention to conform to the standard code now in use, but it is obvious that the selection of colors made, may be departed from, wholly or in part.

Having thus described my invention, what I claim as new, and desire to protect, by Letters Patent, is:—

1. In a device of the class described, an internally illuminated housing having an open front; a double set of end guides transversely mounted in the open front of the housing; intermediate guides transversely mounted in the housing, disposed between the planes of the end guides and arranged to divide the front of the housing into a plurality of like spaces; stenciled and opaque plates and transparent colored screens removably and interchangeably mounted in the intermediate guides; glass plates removably mounted in the end guides.

2. In a device of the class described, an internally illuminated housing having an open front; a double set of end guides transversely mounted in the open front of the housing; intermediate guides transversely mounted in the housing, disposed between the planes of the end guides and arranged to divide the front of the housing into a plurality of like spaces; stenciled and opaque plates and transparent colored screens removably and interchangeably mounted in the intermediate guides; a transparent glass plate removably mounted in one pair of the end guides to the front of the intermediate guides; a glass plate having a frosted surface, mounted in a pair of the end guides to the rear of the intermediate guides.

3. In a device of the class described, a housing having a plurality of pockets; inter-

changeable plates arranged for slidable insertion into the pockets, each of said plates comprising a body portion bearing a stenciled character and being provided with a lip upstanding from the body portion above the upper edge of the pocket, the said lip bearing a reduced facsimile of the character carried by the body of the plate, the said reduced facsimile being arranged to alter the character of the lip to provide a finger hold.

4. In a device of the class described, an internally illuminated chamber having an open front; opaque and stenciled plates and colored screens; means for mounting the said plates and screens slidably and interchangeably in the open front of the housing; lamp boxes mounted at the ends of the chamber; lamps mounted within the lamp boxes; guides carried by the interior of the lamp boxes; colored screens arranged to register in the guides in the lamp boxes.

5. In a device of the class described, a housing comprising an internally illuminated chamber having an open front, arranged to receive slidably and interchangeably opaque and transparent slides; and internally illuminated lamp boxes, mounted upon the ends of the chamber, the said lamp boxes having means for varying the color of the light displayed; a day signal removably mounted upon the top of the housing at its front; other day signals removably mounted upon the top of the housing, diagonally crossing the ends of the housing and arranged for interchangeable use with the day signal carried by the top of the housing at its front.

6. In a device of the class described, a housing comprising an internally illuminated chamber having an open front arranged to receive slidably and interchangeably, opaque and transparent slides; and internally illuminated lamp boxes mounted upon the terminals of the chamber, the said lamp boxes having means for varying the color of the light displayed; sockets carried by the rear corners of the housing, and other sockets carried by the front of the housing; a day signal having its arms arranged to register with the sockets in the front of the housing; other day signals, each having an arm arranged to register with the corner sockets, and an arm arranged to register with the adjacent socket on the front of the housing.

7. In a device of the class described, a housing; a lid mounted upon the housing; sockets carried by the rear corners of the housing; and other sockets carried by the front of the housing; a day signal comprising a body portion and arms depending from the body portion, one of said arms being arranged to register with a corner socket, and one of said arms arranged to register with one of the front sockets, whereby the body portion may be disposed diagonally across the lid, and in contact therewith.

8. In a device of the class described, a housing; a lid mounted upon the housing; day signals slidably carried by the housing, disposed diagonally across the lid and arranged to rest upon said lid.

9. In a device of the class described, a housing; a channel sunk into the end of the housing and disposed parallel to its upper edge; a lid having a portion of its end downturned and brought into sliding relation with the channel, the remaining portion of the end of the lid outstanding in the plane of the lid; a catch mounted upon the outstanding portion of the lid and extending to the rear of the lid; a boss carried by the rear terminal of the catch; carried by the front corner of the housing a tubular socket having a longitudinally disposed slot; a shoulder upstanding from the front of the tubular socket at its top, the said shoulder arranged to impinge the boss, the tubular socket arranged to receive the boss, and the longitudinally disposed slot arranged to receive the catch, when the lid is drawn forward.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

ROBERT L. CAIRNCROSS.

Witnesses:

JAS. M. WALKER,

MASON B. LAWTON.