May 25, 1937. L. G. HANDY 2,081,744

SIGNALING DEVICE

Filed April 5, 1934 2 Sheets-Sheet 1

Fig.-10

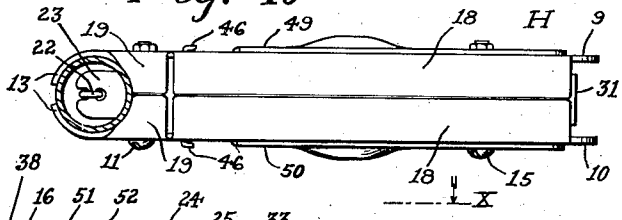


Fig.-1

Fig.-2

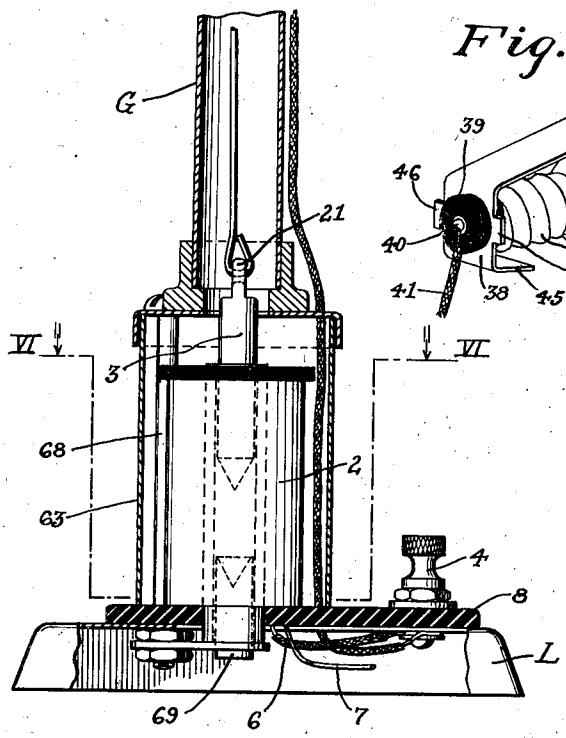
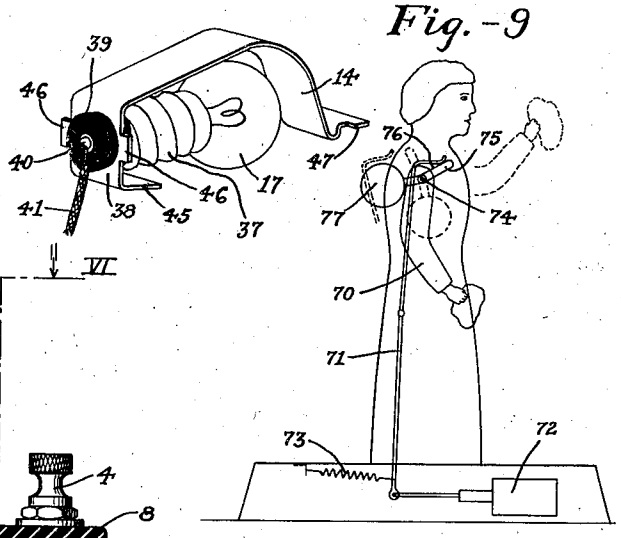


Fig.-9



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Fig. -3

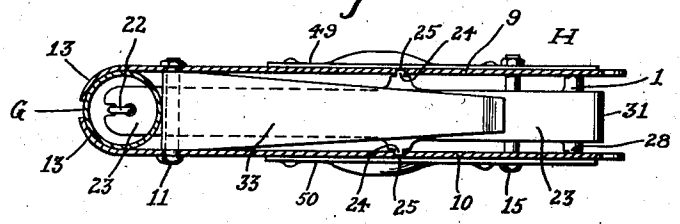


Fig. -4

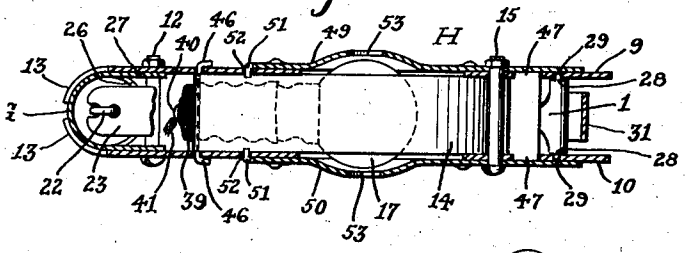


Fig. -5

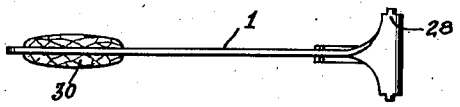


Fig. -6

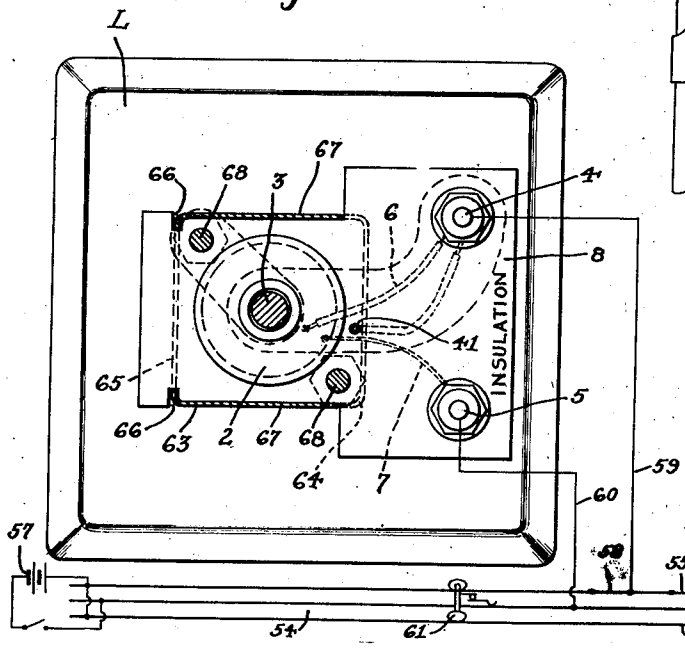


Fig. -7

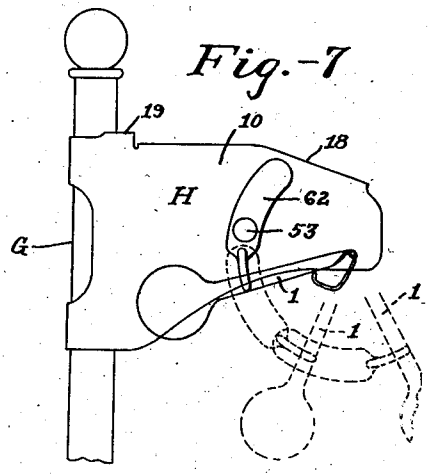
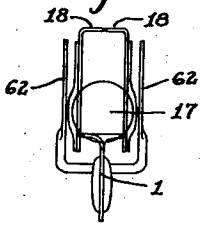


Fig. -8



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Patented May 25, 1937 2,081,744

UNITED STATES PATENT OFFICE

2,081,744

SIGNALING DEVICE

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Application April 5, 1934, Serial No. 719,079

1 Claim. (Cl. 177—327)

This invention relates to a signal device and particularly to a signal device for use in association with toy electric railways and the like.

An object of the invention is to provide a device of this character and of attractive form and appearance including an arm mounted to freely swing to and fro by gravity, as a signal.

A further object is to provide means operable, for instance as the result of the approach of a train, to cause the arm to thus swing.

A further object is to so construct the device that it will include a mounting for the arm, a means to normally hold the arm against its inherent tendency to swing by gravity, a means whereby the arm will be released when desired to begin its free oscillatory swinging, and a means whereby the arm will be returned to its normal at-rest position.

A further object is to provide a device as indicated and in which the arm is visually oscillatable through a succession of free gravity oscillations as a visible signaling means, and to provide means, first, to institute the visible oscillations, second, to permit continuation of said visible oscillations under free gravity actuation for a succession of times, and finally, to obscure the oscillatable arm thereby terminating the signal.

A further object is to provide connections whereby the travel of a train along the rails of the toy system will, first, institute visible oscillations of the signaling arm, second, permit an uninfluenced continuation of said visible oscillations for a succession of times as the train continues to travel, and finally, cause the oscillatable arm to become obscured as the train reaches a predetermined point.

A further object is to provide illuminating means for said arm during the swinging thereof.

A further object is to so construct the device that the arm illuminating means will be adapted to provide illumination of said arm without being carried upon said arm.

A further object is to so construct the device that it will include an illuminated signal additional to the arm and further to provide for "blinking" of said additional signal during the swinging of the arm.

A further object is to so construct the device that it will include an electric bulb disposed for illumination purposes, and to provide for the easy placement and displacement of said bulb for renewal purposes as may be required.

A further object is to so construct the device that it will be strong, substantial, easily and securely assembled and so that it may be produced at small cost.

Other objects and aims of the invention, more or less specific than those referred to above, will be in part obvious and in part pointed out in the course of the following description of the elements, combinations, arrangements of parts and applications of principles constituting the invention; and the scope of protection contemplated will be indicated in the appended claims.

In the accompanying drawings which are to be taken as a part of this specification, and in which I have shown merely a preferred form of embodiment of the invention:—

Fig. 1 is a vertical central sectional view showing a device constructed in accordance with this invention, parts being shown in elevation.

Fig. 2 is a detached perspective view of the illuminating element and its supporting means.

Figs. 3 and 4 are horizontal sectional views substantially upon the planes of lines III—III and IV—IV respectively of Fig. 1, looking in the direction of the arrows.

Fig. 5 is a plan view of the signal arm detached.

Fig. 6 is a horizontal sectional view upon the plane of line VI—VI of Fig. 1, looking in the direction of the arrows, and diagrammatically showing connection with toy railroad system.

Figs. 7 and 8 are diagrammatic views illustrating the presence of a "blinking" device in association with the swinging arm.

Fig. 9 is a diagrammatic elevational view illustrating a modification in which the swinging signal arm is shown as being the arm upon a representation of a human figure, and

Fig. 10 is a top plan of the upper or head portion, the standard being in section on line X—X of Fig. 1.

Referring to the drawings for describing in detail the structure illustrated therein, and referring first to the structure Figs. 1 to 6, the reference character L indicates a suitable base or foundation member upon which is supported a standard G of any suitable height and construction and the reference character H indicates generally the head portion which is arranged at the upper end of the standard and which carries the oscillatable signal arm 1.

At its lower end the standard G is suitably enlarged to contain a solenoid magnet or the like as **2** with which is associated the iron core **3**, the core being normally in an elevated position, substantially as illustrated, but being adapted to be drawn down into the solenoid whenever the

solenoid is energized, the core continuing in its lower position within the solenoid as long as the solenoid remains energized.

Upon the base L is carried a pair of binding posts as 4 and 5 with which opposite conductors as 6 and 7 respectively connect from opposite sides of the solenoid, said binding posts being insulated from each other by being mounted upon an insulating carrier 8.

It is noted here that the binding post 5 is grounded at its lower end upon the metal of the base L, and that the standard G and head H, all of which parts are also of metal and are in metallic contact with the base L and hence carry the ground side of the circuit.

The head H may be constructed in any manner but preferably consists of opposite side members as 9 and 10. These are spaced apart at opposite sides of the standard G and are shown as being held in position upon the standard by being clamped against the standard as by clamp bolts or rivets 11—12, the standard serving to hold the plates spaced a definite distance apart where they engage the standard.

Hook-like portions as 13—13 of the plates extend part way around the standard and co-operate with the holding devices 11—12 to retain the plates rigidly in place.

The portions of the plates which extend away from the standard and which carry the signal arm 1 are held definitely spaced apart by suitable means such for instance as a spacer 14, a clamp bolt or rivet as 15 extending between these portions of the plates and clamping them against the edges of the spacer so that thus the plates are maintained in substantial parallelism with each other and spaced a definite distance apart throughout thereby forming a protected cavity or compartment as 16 between them within which moving parts of the mechanism are contained and within which may be located the illuminating bulb 17 safe from harm.

A top wall may be conveniently provided for this compartment by flanges as 18—18 turned inwardly toward each other from the plates or walls 9 and 10, and similar small flanges as 19—19 may be provided upon the plates for engaging edgewise against the standard to assist in holding the plates in definite position upon the standard.

The standard G is hollow, and a connecting rod as 20 extends longitudinally thereof being attached by its lower end as at 21 to the solenoid core 3 and by its upper end, as at 22, to one end of an operating lever 23 for the signal arm.

The lever 23 is arranged within the compartment 16 and is pivotally mounted intermediate its length as by its portion 24 in spaced bearings 25—25 of the plates 9 and 10. Its end which is attached to the connecting rod extends into the standard through an opening 26 of the standard.

Portions of the material of the standard displaced in the formation of the opening 26 may be bent outwardly to constitute parallel spaced flanges as 27—27 resting flush against the inner surface of the plates or walls 9 and 10, and thereby defining the radial direction from which the head extends with respect to the standard.

The signal arm 1 is arranged within the compartment 16, or substantially so, and is pivotally mounted by one of its end portions as 28 in spaced bearings as 29—29 of the plates 9 and 10. Its free end is weighted as at 30 and the pivotal engagement within bearings 29 is sufficiently loose so that the signal arm is adapted to swing readily to and fro for a plurality of uninfluenced gravity controlled oscillations whenever it is released, the oscillations continuing for a considerable period of time or until they are purposely stopped by the lever 23.

The signal arm is held normally swung upward to an approximate horizontal position within, or almost completely within, the compartment 16, being held in this position by the free end portion 31 of the lever 23, as indicated by the full lines in Fig. 1, and is released to begin its free oscillatory movement whenever the end 31 of the lever 23 is moved away by the solenoid.

The signal arm 1 is provided with a surface portion 32 against which the end portion 31 of lever 23 engages when moving the arm to its upper or non-signaling position, it being here noted that when the arm is in its non-signaling position the surface 32 stands nearly in a position at right angles to a straight line extending to the pivot 24 and that on this account the weight of the signal arm in its natural tendency to fall by gravity is felt more as a lateral strain against the pivots in the bearings 25 than as a strain tending to rotate the pivots in said bearings. Very little power in the lever 23 is required to hold the signal arm in its normal or non-signaling position.

A light spring as 33 is arranged within the compartment 16 to press against the free end portion of the lever 23 so as to normally hold said lever in position retaining the signal arm in non-signaling position, this spring serving at the same time of course to also hold the solenoid core 3 elevated.

The spring 33 also operates to swing the signal arm into non-signaling position after each signaling operation.

The spring 33 may be conveniently held in position by having its base end portion engaged between the underside of the flanges 18 of the head and the upper side of the clamp bolt 11, the material of the spring being hooked downwardly about the clamp bolt as at 34 so as to engage between said bolt and the wall of the standard and be thereby held against endwise movement.

The signal arm is preferably formed with a further surface portion as 35, continuing from the surface portion 32, and terminating in a seat 36, these elements 35 and 36 being adapted for engagement by the end portion 31 of the control lever 23 whenever the signal arm is for any reason moved manually upwardly to an abnormal position, as indicated by the heavy dotted lines in Fig. 1.

The surface portion 35 is disposed at a divergent angle with respect to the pivotal mounting of the signal arm so as to always co-operate with the lever 23 to insure that said lever when in engagement with said surface will urge the signal arm downwardly.

The seat 36 is so disposed that it will receive, with a light snap action, the end portion 31 of the lever 23 whenever the signal arm is manually moved to its upper abnormal limit, that is to the position shown by the heavy dotted lines in Fig. 1, the seat and the lever co-operating at this time to hold the signal arm in its extreme position. This is important as a means to hold the signal arm away from proximity to the illuminating bulb 17 whenever it is desired to adjust or renew said bulb. To disengage the signal arm so that it will again be in proper functioning relationship it is only necessary to manually move the arm

downwardly a slight distance sufficient to disengage the seat 36 from the end of the lever, whereupon the cam action of the lever against the signal arm will become effective to swing the arm to normal non-signaling position.

The bulb 17 may be mounted in any appropriate manner, but as illustrated herein the mounting consists of a metallic socket as 37 into which the bulb may be screwed, or from which it may be unscrewed, at will in the usual manner. This socket is connected with a portion as 38 of the metallic spacer member 14 heretofore mentioned, and since this spacer is in metallic contact with the plates or walls 9 and 10 the socket 37 is thus made to carry the ground side of the circuit.

An insulating piece 39 at the base of the socket 37 carries a center contact as 40 for the bulb and this contact is connected as by an insulated cable 41 with the binding post 4, the cable 41 extending from the contact 40 downwardly out of the compartment 16, and downwardly along the standard.

The spacer 14 extends transversely of the compartment 16 directly above the bulb, and its undersurface is preferably of a polished brightness so that it constitutes a reflector effective to project light rays downwardly from the bulb and in the general direction of the signal arm thereby effectively illuminating the signal arm whenever the bulb is lighted.

Carried by the signal arm is a suitable reflector member as 42 adapted to receive and reflect these light rays during the swinging of the arm so that the signal arm is thus made to appear to itself carry a direct source of illumination.

The reflector member 42 may be provided in any desired manner but by way of example the drawings herewith show said member to be a transparent or translucent piece of red glass or the like, and as having its opposite surfaces cut with a multiplicity of angularly disposed facets as 43—43. This reflector member may be positioned and held within an opening as 44 through the signal arm, and it is of considerably greater thickness than the surrounding portion of the signal arm so that it thus projects at opposite sides of the signal arm as clearly seen in Fig. 5, the projecting portions lying directly in the rays of light from the bulb 17 and its reflector 14 so as to be fully illuminated whenever the bulb is lighted.

The presence of the opening 44 in the signal arm enables the free projection of light rays through the signal arm from one side to the other of the reflector member 42 not only from the bulb 17 but at all times whether the bulb be lighted or not, and thus the reflector 42 is at all times conspicuous and attractive.

The spacer 14 may be conveniently provided with an extension part as 45 extending beneath the socket 37 in a position to constitute a limiting stop and bumper for the signal arm adapted to define the at-rest or normal non-signaling position of said arm. This extension may be slightly resilient so that it is adapted to cushion in its function as a bumper.

The spacer 14 may be formed with two sets of tangs as 46—46 and 47—47 disposed adjacent opposite ends respectively of the spacer. These tangs extend into openings made to receive them in the plates 9 and 10 and thus serve to hold the spacer, and hence the bulb, in its proper appointed position within the compartment 16. They may if desired continue beyond the outer surfaces of the plates 9 and 10 and be bent over so as to constitute a means to lock the plates together, being in this connection either supplementary to the clamp bolts 11, 12 and 15, or a substitute for one or more of said bolts.

In order to provide for more easy access to the bulb 17 for adjustment or substitution of said bulb the plates 9 and 10 of the head are cut away as at 48 adjacent the bulb and separately formed cover members as 49 and 50 are provided said cover members being detachably connected with the plates 9 and 10 respectively by suitable means as for instance by the clamp bolts 15. They may be formed with retaining tangs or the like as 51 spaced from the clamp bolts 15 and engaging within apertures 52 of the plates 9—10 to assist in holding them in position.

These cover members may be suitably bowed or convexed as may be required to provide ample space for the bulb, and they may be formed with bulls-eye openings as 53—53 through which light rays from the bulb may be always visible. These bulls-eye openings, with the bulbs, thus constitute a signal irrespective of the presence of the signal arm 1. The bulb is connected in parallel with the solenoid 2 and the bulls-eye openings are thus illuminated at the same time and by the same means as controls the solenoid. The bulls-eye openings are without illumination whenever the signal arm is in its normal obscured position within the compartment of the head but they are illuminated at the same instant when the arm is released, and they remain illuminated, except as hereinafter mentioned, until the arm is again obscured.

As an example of means effective to operate this device the drawing Fig. 6 illustrates diagrammatically at 54 a suitable length of toy electric railway track having opposite side rails as 55—55 and an insulated central or power rail 56 in the usual manner. A source of current supply is indicated at 57 having its opposite sides connected with the rails 55 and 56. One of the rails 55 is provided with an insulated track section 58 from which a conductor 59 leads to the binding post 4. A second conductor as 60 extends between the power rail and the binding post 5.

Whenever a train, as 61, moves onto the insulated section 58 a circuit is closed extending from the source 57 along the rail 55 through the wheels of the train to the section 58 and thence along the conductor 59 to the binding post 4. From this point parallel branches go through the solenoid and through the bulb, and thence to ground and by wire 60 back to the opposite side of the source along the power rail 56. The solenoid thus becomes energized and the bulb becomes illuminated the instant the train moves onto the insulated track section 58, and remain so until the train moves off of said track section 58.

Energization of the solenoid will draw down the core and swing the end portion 31 of lever 23 against the tension of spring 33 and free of the signal arm so that the signal arm will begin to oscillate, the bulb, and hence the signal arm, being simultaneously illuminated.

By suitably placing the insulated track section 58 in the length of the trackage the swinging of the signal arm and the illumination of the bulb may be made to begin for instance as the train approaches a crossing, the present device in this case being disposed at the crossing as a guard signal therefor.

As soon as the train has passed, that is moved off to the insulated section 58, then the solenoid

will become deenergized, and the spring 33 will operate to swing the signal arm to its obscured at-rest position, the bulb being at the same time extinguished.

If desired the signal arm may be formed with a pair of blinds 62—62 movable therewith to cover and uncover the bulls-eye openings 53 during the gravity swinging of the signal arm as illustrated by the diagrammatic views Figs. 7 and 8.

As a suitable structure for the base L and the lower portion of the standard G the drawings herewith suggest that the standard may be formed with a housing as 63 suitably enlarged to accommodate the solenoid 2.

The insulating carrier 8 for the binding posts 4 and 5 is fixed rigidly with the solenoid, as for instance as being an enlarged lower head of the solenoid.

One side wall of the housing 63 is cut away at its lower end as at 64 to provide an opening through which the insulation 8 extends.

An opposite side wall is similarly cut away as at 65 for the same purpose, but small portions of this wall are retained for engaging within notches as 66—66 of the insulation to hold the insulation against lateral displacement with respect to the housing in all directions.

The remaining side walls as 67—67 embrace edges of the insulation 8 and extend downwardly against the upper surface of the base L. Retaining bolts as 68—68 extend through the housing and through the insulation and through the top wall of the base L to hold all of these parts in rigid relation to each other.

A stationary magnetic core piece as 69 may be mounted upon one of the retaining bolts 68 if desired.

The spacer 14 and the bulb socket and bulb carried thereby may be made up as a separate entity as illustrated in Fig. 2 and may be handled as such in the assembling of the device and here it is pointed out that in assembling the present signaling device it is simply necessary to place the device Fig. 2, the signaling arm 1, the lever 23, the spring 33 and the standard G in their appointed positions between the plates 9 and 10, with the pivots and tangs of said parts engaging within mating openings of the plates as described, and to then place and tighten the clamp bolts 11, 12 and 15 and/or turn down the tangs 46—47, the operation of fastening the two plates 9 and 10 together sufficing to hold all of the parts assembled in proper relation.

The modification Fig. 9 suggests that if desired the present device may be made up in the form of a representation of a human figure, one of the arms as 70 of said figure being mounted to oscillate by gravity in the same manner as described with reference to the signal arm 1 and being controlled by a lever as 71 which is in turn operated by a solenoid as 72 against the tension of a spring 73, these operating parts corresponding with the lever 23, solenoid 2 and spring 33 of Fig. 1 and having the same relative operative relationship with the signal arm 70.

The arm 70 is shown as being mounted upon a shaft as 74. Within the figure the shaft 74 has fixed thereto an arm 75 which provides a surface as 76, corresponding with the surface 32 of the signal arm 1, for engagement by the lever 71 to retain the arm 70 in its normal lowered position as illustrated in full lines.

A counter-weight as 77 is also connected with the shaft 74 within the figure in position so that by its gravity influence it will always urge the arm 70 toward an elevated position as indicated by the dotted lines.

Whenever the solenoid 72 is energized, as by means similar to that heretofore described with reference to the other structure, the lever 71 is swung out of engagement with the arm 75 so that the counter-weight 77 becomes instantly effective to swing the arm 70 upwardly. Then, so long as the lever 71 remains out of engagement with arm 75 the weight 77 will be free to swing oscillatably by gravity and to swing with it the arm 70. When the solenoid 72 is deenergized the spring 73 will again operate to swing the counter-weight to its full line position and thereby return the arm 70 to its normal or lowered position.

This embodiment of the invention may be made up for use as a toy figure to be placed at any desired point for waving a greeting or signal to a passing train.

The arms 1 and 70 are gravity actuated at all times. The gravity movements being once instituted, as by the travel of a train along the track of the toy railroad system, will continue through a succession of free gravity oscillations during a predetermined period, as while the train is traveling for a given distance along the track. During this period the arms, and their oscillatory movements will be fully visible to an observer so that they will constitute a visible greeting or signaling means.

At the end of this period of visible oscillations, as when the train reaches a given point, the mechanism will operate to more or less obscure the arms and thereby terminate the signaling performance of the arm.

As many changes could be made in this construction without departing from the scope of the invention as defined in the following claim, it is intended that all matter contained in the above description, or shown in the accompanying drawings, shall be interpreted as illustrative only and not in a limiting sense.

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

A signaling device comprising a support, an arm pivotally mounted upon said support for gravity oscillations thereon, and a releasable holding means for said arm having parts cooperative with parts of the arm to stop said oscillations and to move the arm to and hold it in a normal position of rest such that the arm will operate as a pendulum when released from said position, and said holding means and said arm also having parts interengageable when moved to an abnormal position of rest to hold the arm in said abnormal position of rest.

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