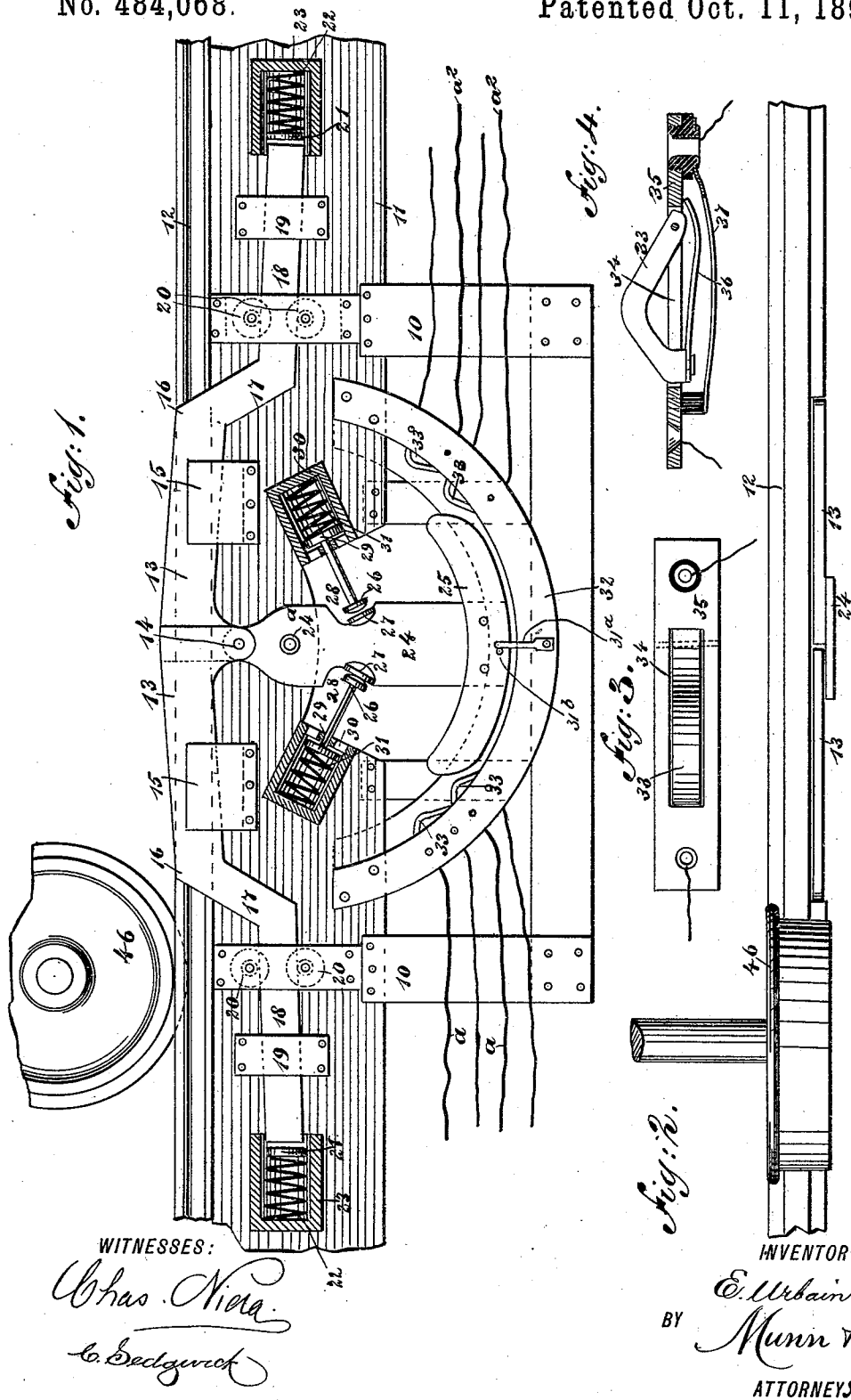


E. URBAIN.
RAILROAD SIGNAL.

No. 484,068.

Patented Oct. 11, 1892.



WITNESSES:

Chas. Nier
C. Sedgwick

INVENTOR

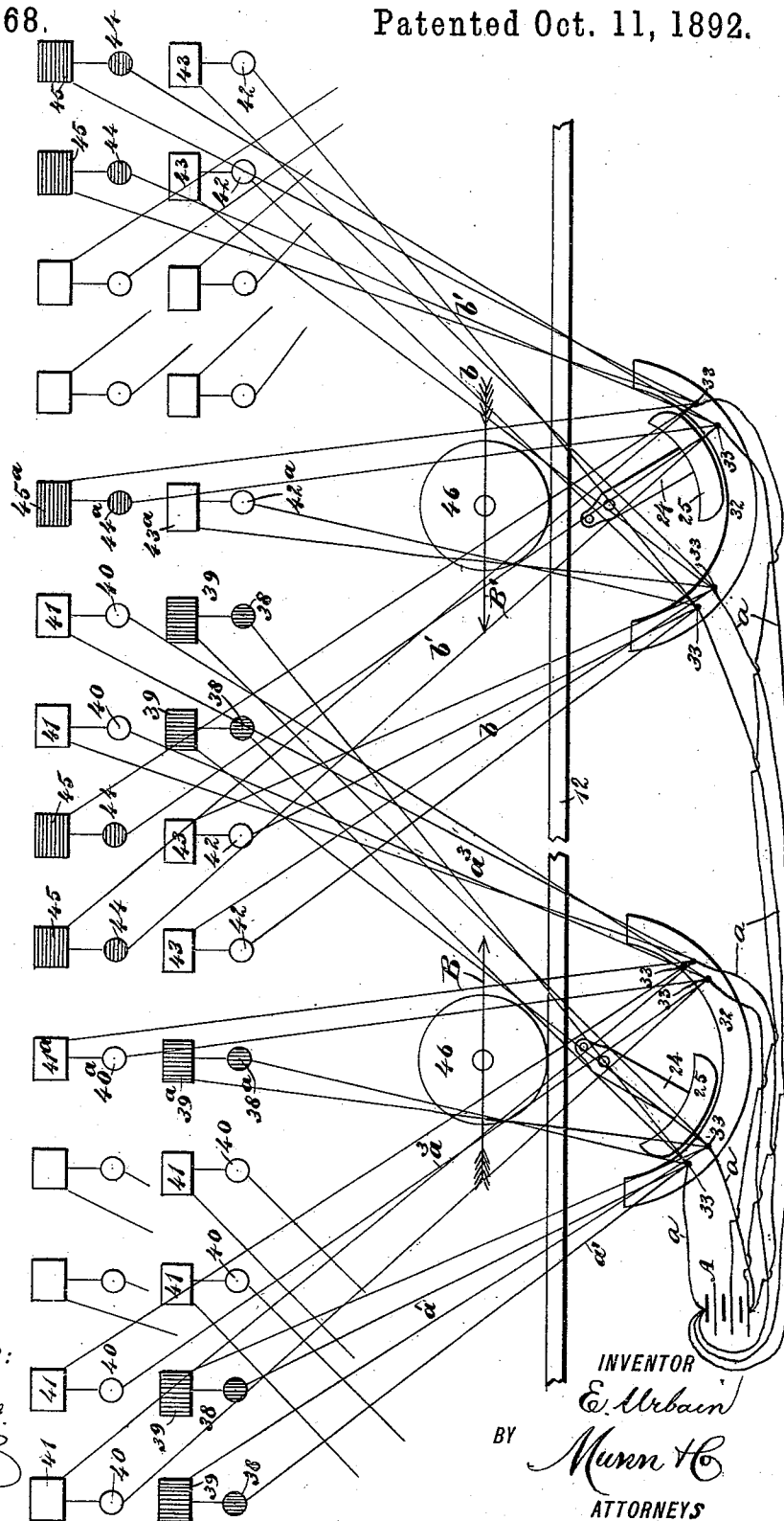
E. Urbain
BY Munn & Co
ATTORNEYS,

E. URBAIN.
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Fig. 5.



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(No Model.)

3 Sheets—Sheet 3.

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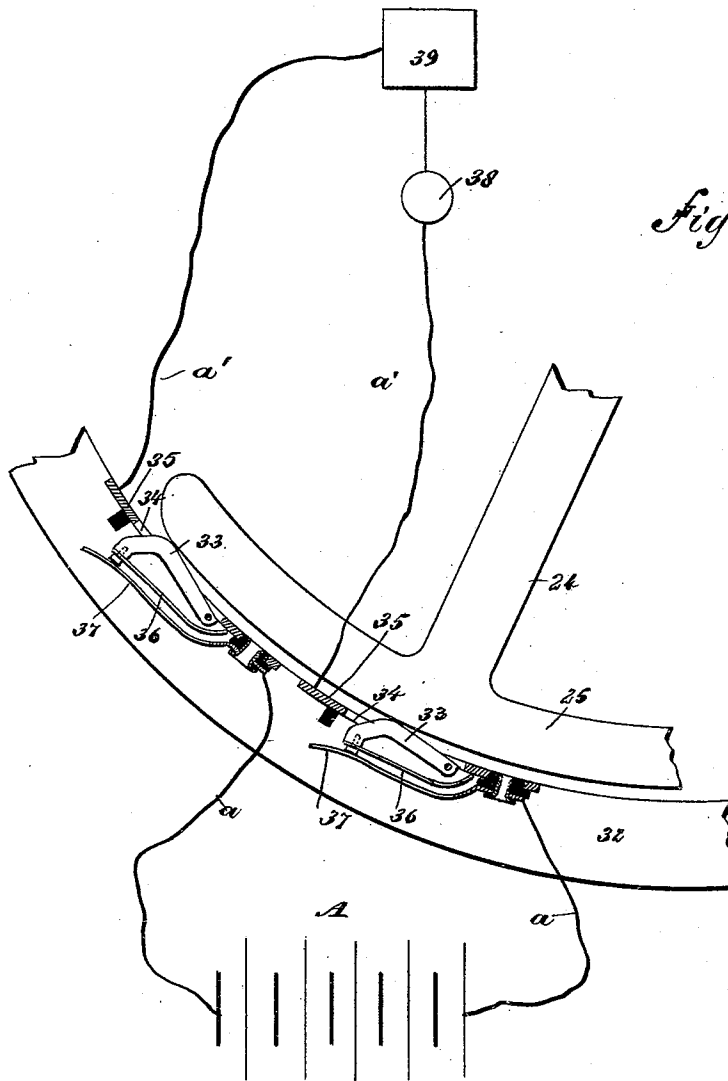


Fig: 6.

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UNITED STATES PATENT OFFICE.

EUGENE URBAIN, OF BROOKLYN, NEW YORK.

RAILROAD-SIGNAL.

SPECIFICATION forming part of Letters Patent No. 484,068, dated October 11, 1892.

Application filed October 20, 1891. Serial No. 409,272. (No model.)

To all whom it may concern:

Be it known that I, EUGENE URBAIN, of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Railroad-Signal, of which the following is a full, clear, and exact description.

My invention relates to improvements in railroad electric signals; and the object of my invention is to produce a signal and mechanism for operating the same which will be operated automatically by a passing train and which will always indicate when a train is approaching, front or rear, or has passed a given point, so that collisions will be rendered impossible.

To this end my invention consists in certain features of construction and combinations of parts, which will be hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similars figures and letters of reference indicate corresponding parts in all the views.

Figure 1 is a front elevation, partly in section, of the operating mechanism of the signal. Fig. 2 is a broken plan view of the same. Fig. 3 is an enlarged detail plan view of one of the contacts. Fig. 4 is a vertical longitudinal section of the same. Fig. 5 is a diagrammatic view showing the manner in which the signal mechanism operates the bells and lights and showing, also, the connections between the bells and lights and the signal-contacts; and Fig. 6 is a detail diagrammatic view of one of the complete light and bell circuits.

The central idea of this invention is to provide means whereby the wheel of a car or locomotive will automatically close an electric circuit through bells and lights placed along the track, and to this end I provide levers which are adapted to be moved by the wheels of a train and which will operate certain circuit-closing mechanism, as described below.

A frame 10 is arranged in the road-bed of a track adjacent to one of the rails, the frame being held in a vertical position, and the upper end of the frame is secured to a suitable support 11, which is arranged directly beneath one of the track-rails 12. Supported in the frame are levers 13, which extend parallel with the track-rail and are in close contact

with it, the levers being placed so as to project slightly above the tread of the rails, and the levers are pivoted together, as shown at 14, and are pivoted to a swinging contact-arm, as described below. The levers may extend any desired distance along the rail, and they are slightly inclined and their top surfaces terminate at 16, at which points the levers are bent diagonally downward, as shown at 17, and then extend along the support 11, as shown at 18. The upper portions of the levers are held to slide in keepers 15, and the lower portions slide on keepers 19 and between anti-friction-rollers 20 in the opposite ends of the frame 10. The lower ends of the levers abut with pistons 21, which are pressed outward by springs 22, held within the cylinders 23, the latter being secured in any convenient way to the support 11. It will thus be seen that when a car-wheel contacts with either of the levers at the point 16 the levers will be pushed parallel with the track-rail, and the downward pressure of the wheel on the lever will prevent the levers from slipping back until after a train has passed, at which time one of the springs 22 will return the levers to their normal position.

The levers 13 at the point 14 are pivoted to a swinging contact-arm 24, which arm is hung on a pivot 24^a, near its upper end, and terminates at its lower end in a curved contact-plate 25, the plate being firmly secured to the arm; but, if desired, they may both be made in one piece. The arm 24 is held normally in a vertical position by the spring-pressed pistons 26, which fit against plates 27, held in the recesses 28 on opposite sides of the arms, and the pistons 26 extend diagonally upward in the path approximately coincident with the swing of the arm, and the upper ends of the pistons are enlarged, as shown at 29, and move in cylinders 30, secured to the support 11, and the pistons are normally pressed against the contact-arm by the springs 31, which are held within the cylinder. The arm 24 is also brought to a state of rest by a flat spring 31^a, which is secured beneath the arm, and the free end of which extends into the path of a stud 31^b on the contact-plate 25. The spring is flexible enough so that when the arm 24 is swung by the action of a passing train the stud will slip over the free end of the spring,

but stiff enough to stop the arm by contact with the stud when the arm swings back to place after a train has passed.

The contact-plate 25 at the lower end of the arm 24 swings above a correspondingly-curved bed 32, on opposite sides of which are the contacts 33, which contacts project into the path of the plate 25, and which are connected with a source of electricity, so that when pressed by the contact-plate the circuit will be closed, as described below. The position of the contacts is such, however, in relation to the plate 25 that when the plate is in its normal position it will not touch any of the contacts. The contacts 33 are curved upward and outward into a cam shape, and each contact is pivoted at one end in a longitudinal slot 34 in the plate 35, which is adapted to be secured in the bed 32. The contact is held in an extended position by the curved spring 36, one end of which is secured to the free end of the contact and the other bears upon the back side of the plate 35. A contact-spring 37 extends opposite the slot 34 on the back side of the plate, the spring being secured at one end and insulated from the plate, as shown in Fig. 4. The plate 35 and contact 33 are connected with one terminal of a circuit and the spring 37 with another. Consequently when the contact is forced against the spring the circuit is closed. The contact mechanism is substantially like that shown in the United States patent to Lungen, No. 309,790, dated December 23, 1884, and forms no part of this invention, and any suitable spring-contact may be used.

The contacts 33 of one side of the bed connect by means of the wire *a* with a battery A, the wires being connected with the contact-springs 37 of the contacts and by the wires *a'*, which connect with the contact-plates 35 and with electric lights 38 and bells 39, arranged alongside of the track at any desired distance in advance and in the rear of the signal-operating mechanism, and the contacts also connect in the same way with a surety light and bell 38^a and 39^a, which are arranged directly opposite the signal-operating mechanism, so that when the wheel of a locomotive strikes the levers 13 at the point 16 and operates the signal mechanism the lighting of the light 38^a or the sounding of the bell 39^a will indicate to the engineer that the apparatus is in working order, and he will know that the lights far in advance and far in the rear have been also lighted. The contacts 33 on the opposite side of the bed connect by means of wires *a*² with the battery A, and also by means of wires *a*³ with lights 40 and bells 41, placed in advance and in the rear of the signal-operating mechanism, and also with a light 40^a and a bell 41^a, placed opposite the signal mechanism to operate as a surety light and signal in the manner described. The lights 38 and 40 are of different colors and the bells 39 and 41 are of different sounds, and the lights and bells are adapted to oper-

ate, according to their color and sound, to indicate the direction of a train—that is to say, we will suppose that the lights 38 are red and that the signal-bells 39 have a certain sound, and that the lights 40 are yellow and the bells 41 have a sound dissimilar to that of the bells 39.

When a train is going in the direction of the arrow B, which we will say is north, the wheel 46 of the train, striking the levers 13 at the point 16, will swing the contact-arm into the position shown at the left hand of the drawings in Fig. 5, thus pressing the contacts 33 against the springs 37 and closing the circuit through the lights 38 and bells 39 and also through the surety light and bell 38^a and 39^a, the circuit being from the battery A through one of the wires *a*, the contact-spring 37, the contact 33, the wire *a'*, leading to the light and bell, the other contact-plate, contact, and spring, and the other wire *a*, and back to the battery, and when the train is going in this direction the engineer will always see red lights and hear a certain sound of a bell, to which sound and color he will quickly become accustomed. If, however, the train is going in the direction indicated by the arrow B' in Fig. 5, the contact-plate 25 and arm 24 will swing in the opposite direction, closing the circuit through the opposite contacts and the lights 40 and bells 41, which lights will show yellow, and the sound will be unlike that of the bells 39. It will thus be seen that if the engineer, going in the direction of the arrow B, or north, sees red lights along the tracks and hears a certain sound he will know that everything is all right and that he may safely go ahead; but if while going in the same direction he sees yellow lights or hears a sound that indicates that a train is approaching from the direction B', or south, he knows then that there is a train approaching him on the same track, and he immediately stops the engine and takes measures to prevent a collision.

Where two or more tracks are arranged side by side, it is evident that each track must be provided with two pairs of signal lights and bells of its own color and sound; and to illustrate this reference may be had to Fig. 5, where at the right hand of the drawings I have shown one set of contacts connecting by wires *b* with lights 42 and bells 43 of a certain color and sound and the opposite set of contacts connecting by wires *b'* with lights 44 and bells 45 of a dissimilar color and sound, the lights 42 and 44 and bells 43 and 45 all contrasting with the lights and bells on the other track and which have been described above, the contacts being connected with the battery in the manner already described. This track is also provided with the surety lights and bells 42^a, 44^a, 43^a, and 45^a. The mechanism just described is an exact duplication of the mechanism at the left-hand side of the drawings; but the lights and bells are of contrasting colors and sounds.

It will be readily understood that this arrangement may be carried out to any extent, and it will be seen that a train cannot pass the levers 13 without operating them and closing an electric circuit through the lights and bells, and as these are placed in advance and in the rear of the train it will be understood that no accident can occur. By reference to Fig. 1 it will be seen that the levers 13 are returned to their normal position by the springs 22 and also by the springs 31 and the spring 31^a, the springs being arranged in triplicate to be sure that no accident to the mechanism can occur, as in case one spring breaks the others will do the work. The lights are intended to operate at night and the bells in the day time; but they can be used in conjunction in cases of fog or other necessity, and it will be understood that both bells and lights may be provided with any ordinary switch, so that they may be turned on and off, as desired.

In practice the levers 13 are made long enough to extend the distance between the front and rear wheels of a car, and consequently the levers after being struck by the car-wheels will, owing to their inclined upper faces, be held by the pressure of the car-wheels from returning to their normal position till after the entire train has passed, and the signal will be operated during the time taken by the train in passing the levers.

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

1. A railroad electric signal comprising a series of electric lights and bells arranged alongside the track, circuit-closing contacts connected with the lights and bells and placed adjacent to a track-rail, vertically and longitudinally movable levers arranged in pairs placed near the track in the path of the car-wheels, said levers having oppositely-extending inclined upper faces, and means for operating the circuit-closing contacts by the

movement of the levers, substantially as described.

2. The combination, with the electric lights and bells and the circuit-closing contacts placed adjacent to the track-rails, of longitudinally and vertically movable spring-pressed levers placed adjacent to a track-rail, said levers having inclined upper faces which terminate in shoulders arranged in the path of the car-wheels, the outer ends of the levers being bent downward and held to slide in suitable guides or keepers, and means for operating the circuit-closing contacts by the movement of the levers, substantially as described.

3. A railroad electric signal comprising electric bells and lights of different sound and color arranged in sets adjacent to a railroad-track, sliding spring-pressed levers arranged parallel with a track-rail, contacts mounted on a curved bed beneath the levers and arranged on opposite sides thereof, the contacts connecting with the different sets of bells and lights, and a swinging arm pivoted to a support, said arm having its upper end connected with the track-levers and having its lower end adapted to press upon the contacts, substantially as described.

4. In a railroad electric signal, the combination, with the sliding and vertically-movable levers placed adjacent to a track and a curved bed having contacts on opposite sides thereof, which contacts are electrically connected with the signals, of a swinging contact-arm pivoted to the adjacent ends of the levers, a curved contact-plate secured to the lower end of the arm and adapted to press the contacts, and a spring mechanism for holding the contact-arm out of engagement with the contacts, substantially as described.

EUGENE URBAIN.

Witnesses:

F. W. HANAFORD,
EDGAR TATE.