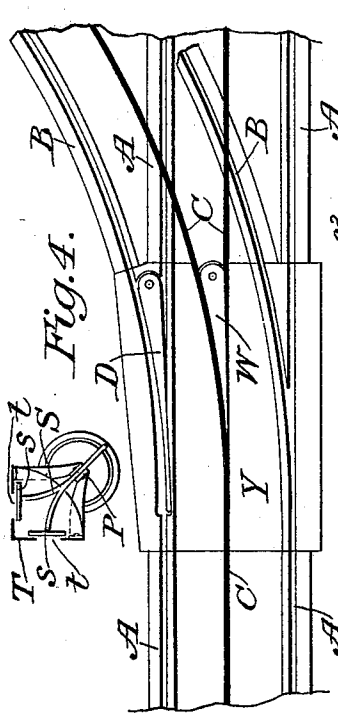
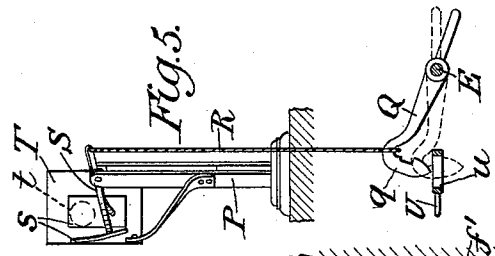
(No Model.) 2 Sheets—Sheet 1.

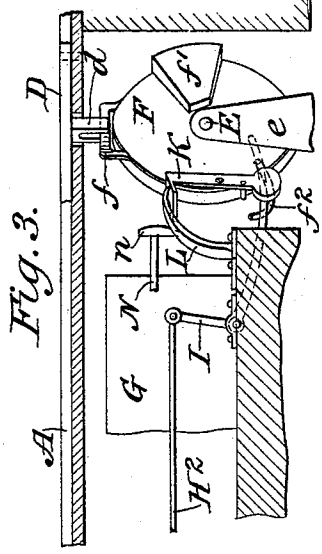
S. S. HEIM.

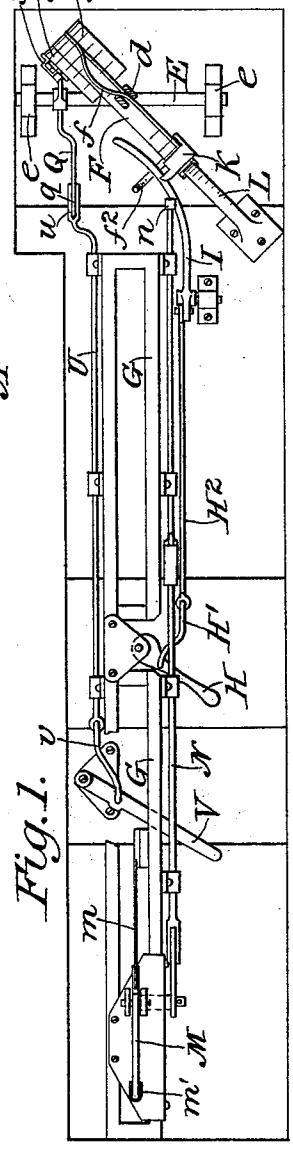
RAILWAY SWITCH AND SIGNAL.

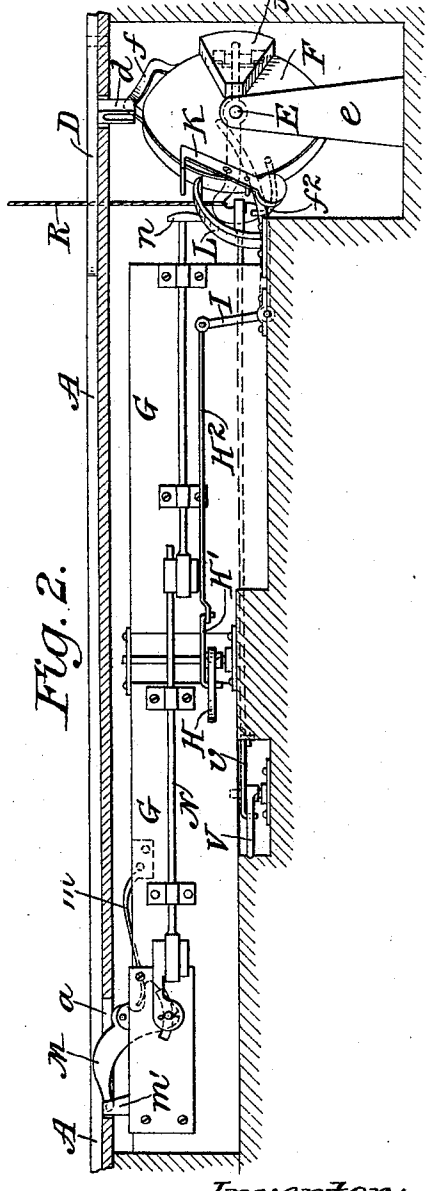
No. 521,611. Patented June 19, 1894.











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(No Model.) 2 Sheets—Sheet 2.

S. S. HEIM.

RAILWAY SWITCH AND SIGNAL.

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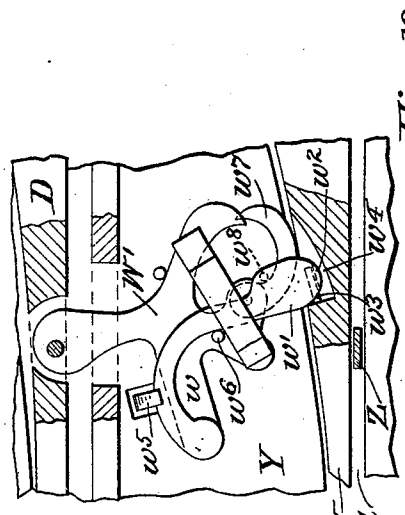

Fig. 9.

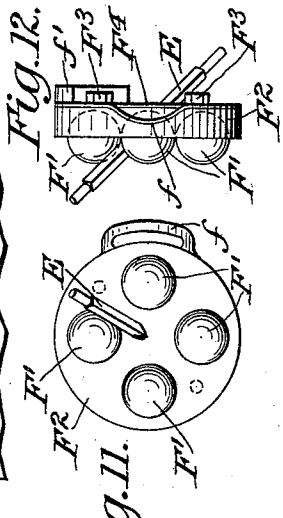

Fig. 12.

Fig. 11.

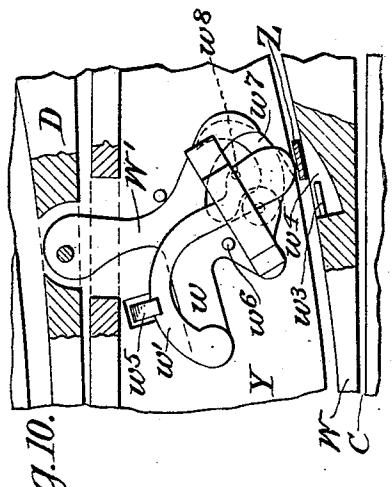

Fig. 10.

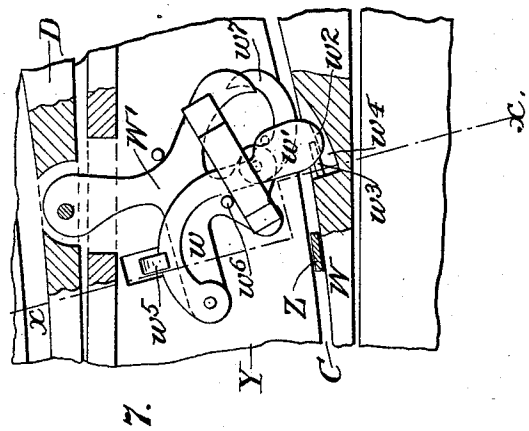

Fig. 7.

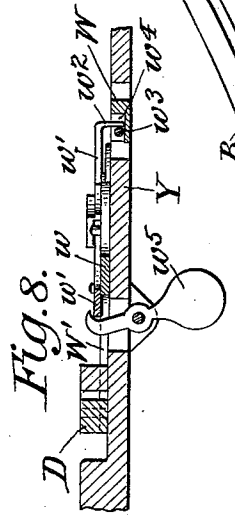

Fig. 8.

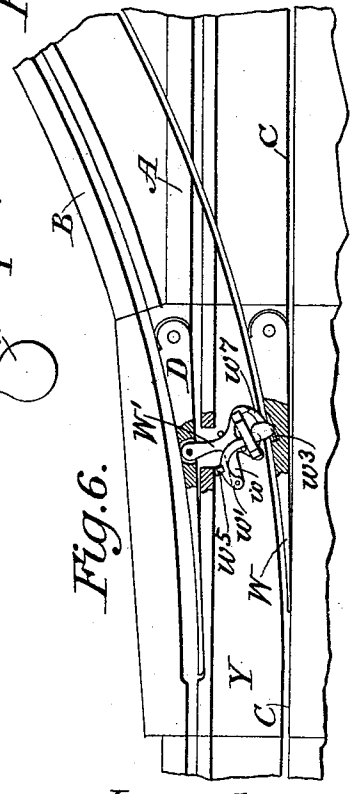

Fig. 6.

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UNITED STATES PATENT OFFICE.

SAMUEL S. HEIM, OF NEW YORK, N. Y.

RAILWAY SWITCH AND SIGNAL.

SPECIFICATION forming part of Letters Patent No. 521,611, dated June 19, 1894.

Application filed February 21, 1894. Serial No. 500,995. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL S. HEIM, of the city, county, and State of New York, have invented certain new and useful Improvements in Railway Switches and Signals; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

This invention relates particularly to switch and signal devices for street railways whereby the approaching car is caused to set the switch before it in the proper position according to the direction the car is to take, and whereby a car which is to turn the corner is caused to give warning of its approach.

The object of the invention is to provide improved means for the purpose referred to above which shall not be liable to be disabled and which shall effect the movement of the switch with certainty.

In the accompanying drawings: Figure 1 is a plan view of the improved switch and signal operating devices, the projection from the under side of the switch tongue being shown in section. Fig. 2 is a side elevation of the same, the walls of the recess in which the devices are located and the cover of the same being indicated in section. Fig. 3 is an elevation of a portion of the devices shown in Fig. 2 in a different position. Fig. 4 is a plan view showing a portion of a street railway track with a branch and with a signal-post in proximity thereto. Fig. 5 is a detached view of the signal and its lock mechanism. Fig. 6 is a plan view of a portion of the railway about the switch, partly broken out to show the devices for shifting the tongue between the diverging grip-slots. Fig. 7 is a plan view of the devices above referred to, but on a larger scale. Fig. 8 is a section on the line x—x of Fig. 7. Fig. 9 is a view similar to Fig. 7 but showing the tongue shifted to allow the passage of the grip through the main slot. Fig. 10 is a view similar to Fig. 7 but showing the position of the parts as the grip passes. Fig. 11 is a side view of the preferred form of the weighted disk which actuates the switch tongue in one direction. Fig. 12 is an edge view of the same.

I have herein shown and described my invention as applied to a cable railway but it will be readily understood that the improved switch and signal operating devices in their essential features might be used with any other form of railway.

In Fig. 4 of the drawings I have represented a portion of a street railway track as arranged at the intersection of two streets where a switch is laid to permit certain cars to be turned off to one side while others are allowed to move straight on. The rails of the main line are indicated at A, A, and those of the branch at B, B. The slot in the top of the conduit is indicated at C and a movable switch tongue at D. The latter is provided, as shown in Figs. 2 and 3 with a projection d on its under side which passes through the supporting plate and is slotted for engagement with the actuating cam.

Journaled in suitable standards e, e, beneath the switch is a shaft E upon which is secured an obliquely disposed and over-balanced disk or wheel F having upon its periphery a cam f to engage the projection d of the movable switch tongue and having fixed to itself suitable weights f' which tend to move the disk in a direction to throw the switch into the position shown in Fig. 4. The means for moving the disk in the opposite direction and the means for releasing it to be moved by the over-balancing weights will now be described.

In the cable conduit, which may be enlarged or have a side recess for the purpose, is suitably secured a frame-work G which supports the devices for actuating and controlling the disk F and the signal. At a suitable distance from the switch a lever H is pivoted to swing on a substantially vertical axis in such position that its free end may be struck by some part of the grip of an approaching car. By a link H′ and rod H^2 the movement of the lever H is imparted to a bell-crank lever I the horizontal arm of which is bent in the shape represented in the drawings and overlies a horn f^2 which projects from the disk F. The shape of the arm of the bell-crank and that of the horn f^2 make the movement of the disk very easy and relieve the parts of any excessive strain. The disk is held in the position to which it is moved by the lever H by means of a latch K

which is pivoted on the disk F and engages a fixed projection L, the latch slipping down past the end of the projection as the disk is moved and then swings into engagement with the under side of said projection under the influence of its weighted lower end. A pin is fixed in the lower portion of the latch K to project past the periphery of the disk F to act as a stop to prevent excessive swinging of the latch. This movement of the disk throws the switch tongue D from the position represented in Fig. 4 into the position which will permit the approaching car to follow the straight track. The tongue will remain in this new position after the passage of the car until the disk is released by another car. I prefer that every car, as it approaches, shall release the disk and that only those cars which are to follow the straight track shall reset the tongue, and for this purpose I slot one of the rails, as at *a*, and mount beneath the slot a lever M which is held normally in the position represented in Fig. 2 by a weight applied to one end or by a spring *m*, as shown. The upper end of the lever M is adapted to be depressed by a car-wheel and is guided by a suitable hood *m'*. The other end of the lever is connected to a push-rod or bar N, which may be made in sections, as indicated, if required by the distance of the lever from the switch, and bears a head *n* which, in the movement of the rod or bar, strikes the latch K and disengages it from the catch L, thereby releasing the disk F and permitting the over-balancing weight to turn it enough to throw the switch tongue back into a position to guide the car from the main line to the branch. Then, unless the grip of the car is adapted to strike the lever H, the switch will remain in the position indicated.

In some cases it will be desirable that warning shall be given at the street corner of the approach of a car. For this purpose I provide for the erection of a signal-post P in a convenient and suitable position and for the control of the signals thereon by the movement of the disk F. In the accompanying drawings the position of the signal-post was determined by the disposition of the several figures of the drawings and by convenience in showing the connections, but in practice it will be placed in such position as will best serve the display of the signals. Upon the shaft E is loosely mounted a lever Q the short arm of which enters an eye f^3 formed on one side of the disk F so that the disk may move independently of the lever under certain conditions. The long arm of the lever Q is connected by suitable intermediate connections, as a cord R, with the signal on the post. The exact construction of the signal is not material, but as represented in Figs. 4 and 5 it consists of a forked lever S the ends of which bear signal plates *s*, *s*, which may be exposed through apertures *t*, *t*, of a hood T. If a lamp is to be placed within the hood at night the upper portions of the plates *s*, *s*, will be made of translucent material suitably colored while the lower portions are opaque. It is obvious that when the disk F is released and is moved by its over-balancing weights to shift the switch into such a position as to guide the car around from the main line to the branch, the lever Q will also be moved or allowed to move to permit the long arm of the signal lever S to fall, and the danger signals to be shown through the apertures of the hood. When the disk and switch are moved in the opposite direction the lever Q, through the connection of the eye f^3 of the disk F with the short arm of the lever will be moved to set the signal to safety. As every car releases the disk F and would therefore set the signal to danger unless additional means were provided for the purpose of preventing such action, I have provided a lock to hold the lever Q and consequently the signal from movement except when a car approaches which is to turn from the main line. For this purpose the lever Q has a tongue *q* which is adapted to enter and be engaged by the slotted head *u* of a locking rod U. The latter is connected by a link *v* to a lever V which is pivoted within the recess for the switch operating devices in such position that it will be struck and moved by projections from the grips of those cars only which are to turn from the main line. Normally, therefore, the lever Q is held down by the locking rod U, but when a car approaches which is to take the switch, the lever Q is released by the action of lever V and rod U and the signal flies to danger. When the disk F moves in the proper direction to clear the signal the tongue *q* of the lever Q enters the slot in the head *u* and, being wedge-shaped, as clearly shown in Fig. 5, draws the rod U and lever V into normal position.

It is desirable that the tongue W between the two diverging slots should be moved with the switch tongue D in order that the grip may not strike upon its end. I have therefore devised means (see Figs. 6, 7, 8, 9 and 10) whereby the tongue shall be so moved and yet shall not interfere with the free passage of the grip. A lever W' is pivoted to the tongue D and extends beneath the usual covering plate nearly to the line of the slot. It has a lateral arm *w* to which is pivoted a bent lever *w'* having at its end a lip or flange w^2 which is adapted to engage a pin w^3 fixed in a recess w^4 in the side of the tongue W. A weighted lever w^5, which is pivoted on the supporting plate Y, bears upon the lever *w'* and presses it toward and into engagement with the tongue W, the movement of the lever *w'* being limited by a pin w^6. A lever w^7 is also pivoted upon the lever W' and is engaged by a pin w^8 whereby it is normally thrust against the tongue W. It will be readily seen that when the tongue D is moved to the position shown in Figs. 4 and 6 the lever w^7 will bear against the tongue W and will push it in the

same direction and that when the tongue D is moved in the opposite direction the lip w^2 will pull the tongue W with it. When the grip, indicated at Z, passes through the main or straight slot the devices for shifting the tongue W are not affected, but when it passes through the branch slot it strikes the lever w', disengages it from the pin w^3, and thrusts it aside, the weighted lever yielding to permit this. The lever w' also carries with it the lever w^7 out of the path of the grip Z. As soon as the grip has passed the weighted lever w^5 returns the lever w' and the lever w^7 with it to their normal positions.

It is necessary in some cases to adjust weights of the disk F according to the requirements of the particular conditions of its use, so the utmost advantage may be secured in moving the switch tongue. For this purpose I prefer to fix the weights, indicated at F', F', (Figs. 11 and 12,) in a disk F^2 which is not itself fixed rigidly to the shaft E but is secured by bolts F^3 to a plate F^4 which is secured rigidly in position upon the shaft E. This arrangement permits the weights to be shifted as they may be required.

The operation of the several features of my invention will now be clearly understood and need not be further described herein.

I claim as my invention—

1. The combination of a switch tongue, an overbalanced disk having on its periphery a cam to engage a projection from said tongue and adapted to shift the same when released, a latch to retain said disk in position, a lever adapted to be moved by an approaching car and intermediate means to disengage said latch and release the disk and means to reset said disk, substantially as shown and described.

2. The combination of a switch tongue, an overbalanced disk engaged therewith and adapted to shift the same when released, a latch to retain said disk in position, means to disengage said latch and release the disk, a lever adapted to be moved by an approaching car a bell-crank having a bent arm overlying a projection from said disk and connections between said lever and bell-crank whereby the movement of said lever returns said disk into position to be held by said latch, substantially as shown and described.

3. The combination of a switch tongue, an overbalanced disk having on its periphery a cam to engage a projection from said tongue and adapted to shift the same when released, said disk being obliquely disposed with respect to its axis of rotation, a latch to retain said disk in position, means to disengage said latch and means to reset said disk into position, substantially as shown and described.

4. The combination of a switch tongue, an overbalanced disk engaged therewith and adapted to shift the same when released, said disk being composed of a plate fixed to its supporting shaft and a weight carrying disk secured to said plate, and means to set said disk in position against the tendency of the over-balancing weights, substantially as shown and described.

5. The combination of a switch tongue, a disk engaged therewith and adapted to shift the same, means to actuate said disk, a signal, a lever connected to said signal to actuate the same and adapted to be operated by the movement of said disk, and a lock adapted to retain said lever from movement independently of the movement of the disk and to be released by an approaching car, substantially as shown and described.

6. The combination in a cable railway of a movable switch tongue, a tongue movably supported between the diverging grip slots, and a connection between said tongues to operate the second from the first and adapted to be disengaged from the second by an approaching grip to permit the passage of the latter, substantially as shown and described.

7. The combination, in a cable railway, of a movable switch tongue, a movable tongue between the diverging grip slots, a lever pivoted to the switch tongue, a second lever pivoted to the first named lever and adapted to engage the second named tongue, and means to press said second named lever into engagement with said second tongue, while permitting the disengagement of the same, substantially as shown and described.

8. The combination, in a cable railway, of a movable switch tongue, a movable tongue between the diverging grip slots, a lever pivoted to said switch tongue, a second lever pivoted upon the first and adapted to engage a second named tongue, and a weighted lever bearing upon said second lever and adapted to hold the same normally in engagement with said second named tongue, substantially as shown and described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

SAMUEL S. HEIM.

Witnesses:
A. N. JESBERA,
A. WIDDER.