No. 650,092. Patented May 22, 1900.

S. NASH.

SWITCH ACTUATING MECHANISM.

(Application filed Sept. 18, 1899.)

(No Model.)

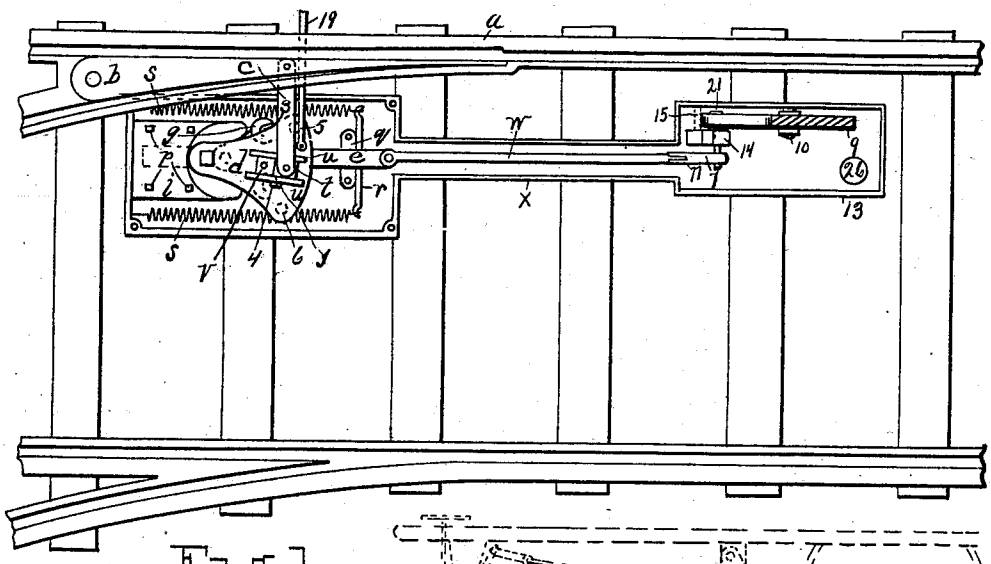


Fig. 1.

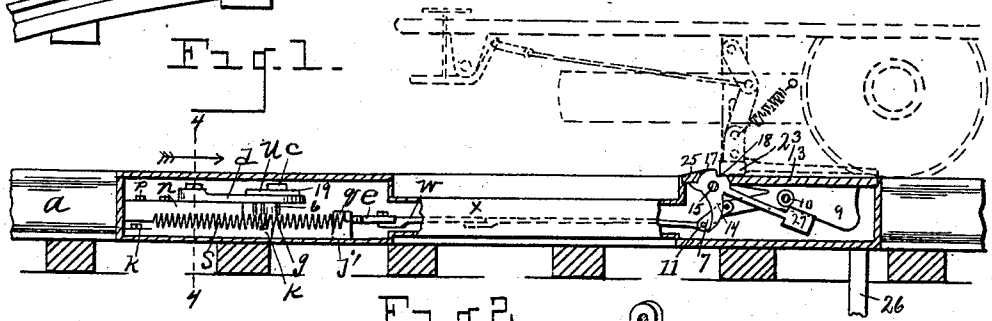


Fig. 2.

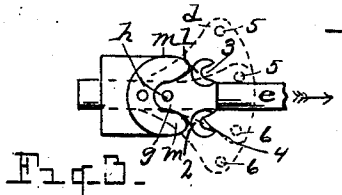


Fig. 3.

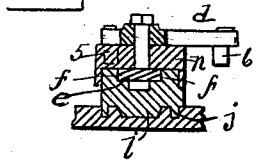


Fig. 4.

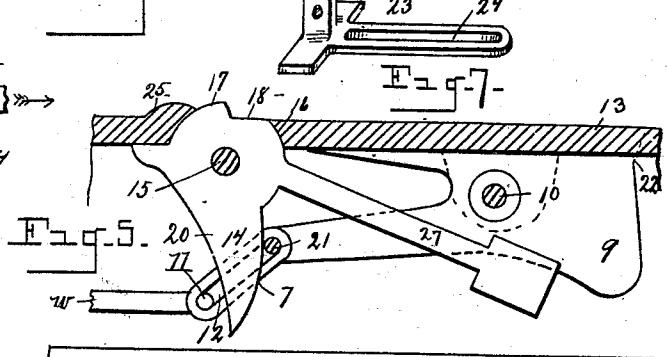


Fig. 5.

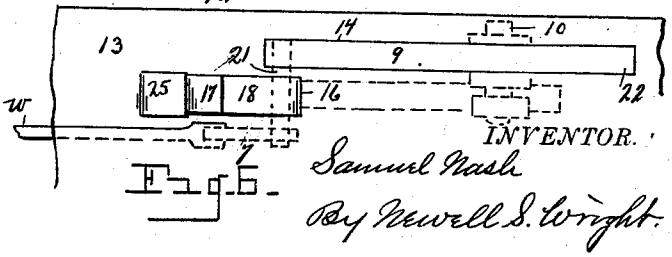


Fig. 6.

Fig. 7.

WITNESSES.

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SWITCH-ACTUATING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 650,092, dated May 22, 1900.

Application filed September 18, 1899. Serial No. 730,826. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL NASH, a citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Switch-Actuating Mechanism; and I declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

The purpose of my invention is to provide a switch-actuating mechanism embodying various novel features, said mechanism being adapted and designed for actuating switches on railways, and more particularly for street-railways; and the same consists of the mechanism hereinafter described, illustrated in the accompanying drawings, and herewith claimed.

In the drawings, Figure 1 is a plan view embodying features of the invention with portions removed. Fig. 2 is a longitudinal section showing parts in side elevation. Fig. 3 is a partial plan view, certain parts being removed. Fig. 4 is a section on the line 4 4, Fig. 2. Fig. 5 is a view of certain parts in side elevation, showing parts in vertical section. Fig. 6 is a plan view of portions of the device. Fig. 7 is a detail view of the actuating device attached to a moving car.

The object of the invention is to provide switch-actuating mechanism of superior economy, utility, and efficiency which shall be positive in its action and which may be readily and conveniently actuated by a motorman or driver on a car whenever circumstances may require, the device not being liable to get out of order.

The invention is more specifically an improvement upon mechanism of this character embodied in Letters Patent of the United States No. 601,858, issued April 5, 1898.

In carrying out my invention as illustrated in the drawings a railway-rail is illustrated at *a*, and a horizontally-oscillatory switch-point of ordinary construction and arrangement is indicated at *b*. The switch-point is actuated by means of a connecting-rod *c*, said rod being connected at the end opposite the switch-point with an oscillatory lever *d*. The lever *d* is actuated by means of a reciprocatory slide *e*, sliding in any suitable ways *f*. Connected with the slide is a laterally-oscillatory dog *g*, fulcrumed to the slide, as indicated at *h*, the dog being constructed with two oppositely-projecting shoulders, (indicated by the numerals 1 and 2,) said shoulders each formed with corresponding recesses (indicated at 3 and 4) on opposite sides of the longitudinal center of the dog to engage corresponding lugs or spurs 5 and 6 upon the lever *d*, said lugs or spurs being located on opposite sides of the longitudinal center of said lever.

The ways *f* may be formed in a supporting-block, (indicated at *i*.) The supporting-block *i* preferably has a rabbeted engagement with a base-plate or bottom of a box or inclosing case, (indicated at *j*.) The block *i* may be held in the case *j* in any suitable manner, as by one or more set-screws *k*. The block *i* is formed on opposite sides of the slide *e* with guide-shoulders *m m*, so arranged that when the pivotal end of the dog is carried between said shoulders the longitudinal center of the dog will be midway between said shoulders and bringing the recesses 3 4 equidistant from the longitudinal center of the slide *e*.

In the patent above referred to the oscillatory lever was fulcrumed on a separate support and was located forward of the dog and facing the dog. My present invention, however, contemplates locating said oscillatory lever *d* immediately above the dog and upon the support of the dog, the dog having a sliding and laterally-oscillatory movement beneath said lever and between the lever and the support *i*. The lever in the present case is fulcrumed upon a cover or plate *n*, which may be fastened upon the support *i* in any suitable manner, as by set-screws *p*. The inclosing case *j'* is provided with a cover-plate, located above the oscillatory lever, as shown in Fig. 2, said plate being omitted in Fig. 1 and also in Figs. 3 and 4. By this arrangement of the dog and the oscillatory lever relative the one to the other I am enabled to assemble the parts in a much more compact manner, securing thereby a very considerable amount of economy in the construction, as owing to the much more compact arrangement of the parts a much smaller inclosing case is re-

quired therefor. Moreover, by such a construction and arrangement there is no longer any necessity of slotting the slide *e*, as only a bracket *q* is required to support one end of the slide *e*.

To retract the slide *e*, said slide is constructed with laterally-projecting arms or a cross-bar, (indicated at *r*,) preferably terminating with hooks at their extremities, with which are connected corresponding springs *s*, which springs by this construction are located at the sides of the support *i*, between said support and the side walls of the inclosing case and all within said case. This location of the springs also very much simplifies the construction and arrangement of the device, inasmuch as the springs so located are easily got at by simply removing the cover of the case, and it is unnecessary to remove any of the parts to get at said springs other than the cover of the case. I prefer also to connect the connecting-rod *c* with the lever *d* by means of a movable block *t*, made movable in ways *u* upon said lever, said block held in place in any suitable manner, as by a set-screw *v*. In this manner the adjustment of the throw of the switch-point can readily be made, and it is unnecessary to move any parts of the mechanism to secure such adjustment.

With the slide *e* is connected a connecting-rod *w*, which may pass through a suitable covering or case *x* underground for a suitable distance, said connecting-rod being provided with a link 7 at the end opposite the slide *e*, said link being formed with or without an arc-shaped slot 12 and suitably connected with the rod *w*, as indicated at 11. It will be understood that the rod *w* will be carried along the track a sufficient distance to enable the driver or motorman on the car to cause the switch to be thrown in proper season. To accomplish the movement of the slide *e* through the movement of the rod *w*, I provide a lever 9, fulcrumed, as at 10, to the side of an inclosing case 13, as shown, said lever being suitably engaged with the link 7, as by a pivot-pin 21.

If it is desired to connect with this apparatus a signaling device located, for example, on the curb, any ordinary signaling device (not shown) may be connected with the lever *d* by means of the connecting-rod 19. The movement of the corresponding rod 19 with the signaling device will of course show the position of the switch-point.

As fully pointed out in the patent referred to, whenever the switch-point is actuated either to open or close the switch the lever *d* will occupy a corresponding position, carrying the lugs 5 and 6 either toward or away from the longitudinal center of the lever, as the case may be. As described in said patent, the lugs or pins 5 6 of the lever and the recesses 3 4 of said dog are so located and arranged with relation to each other that when the switch-point is open one of the recesses of the dog will engage one of the lugs or pins of the lever when the slide *e* is drawn, and when the switch-point is thrown in the opposite direction the other of said recesses will engage the other of said lugs or pins on the lever, one recess of the dog only being engageable on a movement of the slide with one of the lugs or pins of the lever. Which recess of the dog shall engage with the corresponding lug of the lever depends entirely upon the location of the switch-point. It will be observed that whatever may be the location of the switch-point the operation of the blade *e* and the corresponding actuation of the dog engaging a corresponding pin or lug of the lever will move the switch into the opposite direction. Thus if the switch be open a movement of the slide *e* causing the dog to engage the lever will close the switch, and vice versa. Thus a movement of the slide *e* will always throw the switch-point into the contrary position from that occupied when the slide is actuated.

The case 13 is slotted at the top thereof to permit the upper edge of the lever 9 to project therethrough, as shown at 14, the upper edge of said lever being prolonged a required distance and also weighted at the portion thereof opposite the connection of the rod *w* therewith, so that said lever will be automatically restored to normal position. Normally the upper edge of the lever 9 is flush with the upper surface of the case 13, but is arranged so that the corner thereof (indicated at 22) may be tilted upward when said lever is correspondingly tilted upon its fulcrum, the said lever being upwardly tilted thus so that a suitable device attached to the moving car may engage the upturned edge or end of said lever to give to the lever a further throw in order to actuate the rod *w*, the initial upturning of the lever 9 being simply sufficient to enable the device upon the moving car to engage therewith, the said initial movement of the lever otherwise than for this purpose being an idle movement so far as other parts of the device are concerned, said movement not being sufficient to actuate the rod *w*. To effect this initial movement of the lever 9, a lever 14 is provided, suitably fulcrumed, as at 15, in the case 13. A portion of this lever projects through a corresponding orifice 16 in said case, the upper end of the lever being preferably disk-shaped, with a normally-upstanding shoulder 17 and a horizontal portion 18, normally flush with the top of the case, the shoulder 17 projecting thereabove. The lever is provided with a weighted arm 27 to restore it to normal position and with a downwardly-projecting arm 20, arranged to contact with the pin or other suitable device (indicated at 21) attached to the adjacent end of the lever 9, the construction being such that when the lever 14 is suitably tilted the arm 20, contacting with said pin, will cause the tilting of the lever 9 to throw it up into position to be engaged by a suit-

able device upon a moving car. Such a device is indicated in Fig. 7 and may consist of a bell-crank 23, secured to the car, the lower end being constructed with a loop 24 to engage the lever 9 when tilted, as above described. When said bell-crank lever 23 is tilted by the driver of the car, it is designed first to contact with the upper surface of the case 13 and to scrape across the upper edge of the lever 9, clearing it from any snow or dirt until it shall strike the shoulder 17, thereby tilting the lever 14 and throwing the lever 9 up into the loop. As the car is moving the loop will thus engage the uptilted lever 9 and give to said lever a further tilting movement sufficient to operate the rod *w*. I prefer that the case 13 should be provided with a shoulder 25 adjacent to the upwardly-projecting edge of the lever 14, said shoulder forming a backing for the upwardly-projecting portion of said lever and serving also as a scraper to clear the adjacent portion of said lever from dirt as it is being tilted. It will be apparent that with such a device whenever the car passes over or past the tripping mechanism should it not be desired to throw the switch the driver will of course not throw down the actuating or tripping lever. The case 13, with the related portions of the mechanism connected therewith, may be located at any desired point between the rails and it will be seen is entirely separate and distinct from the rails, and thus does not require any alteration of the ordinary rails in use, thereby effecting a very great saving in the application of the device. Should any vehicle pass over the shoulder 17 and trip it, it will be apparent that owing to the lost motion afforded by the link, as above described, there will be no movement of the rod *w*. The free motion permitted by said link without operating the rod *w* thereby saves a considerable amount of wear and tear upon the parts that would otherwise be liable to be frequently operated, inasmuch as said link permits a certain amount of free movement before said connecting-rod will be operated.

The bottom of the case may be provided with an opening 26, beneath which may be sunk a piece of tubing or well to receive any drainage from the case 13.

It is obvious that the construction above described simplifies the mechanism and economizes the cost of construction, at the same time saving the wear of the mechanism, and thereby rendering it more durable.

My invention contemplates not only a link, slotted or otherwise for the purpose described, but any suitable means to actuate the slide having a free movement for a desired distance without actuating the slide.

What I claim as my invention is—

1. In a switch-actuating mechanism, the combination with a switch-point, of a lever connected therewith, a reciprocatory slide provided with an actuating device to engage said lever and throw the switch-point, and means to actuate said slide, said lever and said actuating device located the one above the other, substantially as set forth.

2. In a switch-actuating mechanism, the combination with a switch-point, of an oscillatory lever connected therewith, a reciprocatory slide, a dog mounted thereupon to engage said lever and throw the switch-point into opposite direction from that occupied, and means to actuate said slide, said lever located above said dog, substantially as set forth.

3. In a switch-actuating mechanism, the combination with a switch-point, of a box, a support within the box, a slide reciprocatory in said support, a dog mounted upon said slide, an oscillatory lever having a fixed fulcrum on said support, and means actuated by a moving car to actuate said slide, substantially as set forth.

4. In a switch-actuating mechanism, the combination with a switch-point, of an oscillatory lever connected therewith, a reciprocatory slide provided with an actuating device to engage said lever and throw the switch-point, means to actuate said slide, and a signaling-bar connected with said lever, substantially as set forth.

5. In a switch-actuating mechanism, the combination with a switch-point, of an oscillatory lever connected therewith, a slide provided with an actuating device to engage said lever and throw the switch-point, and means actuated by a moving car at a point distant from the switch-point to actuate said slide, the means to actuate the slide having a free movement for a desired distance without actuating the slide, substantially as set forth.

6. In a railway-switch-actuating mechanism, the combination with a switch-point, an oscillatory lever, a device connecting the switch-point with the lever, a reciprocatory and oscillatory device to engage said lever to throw the lever and actuate the switch-point, a slide to actuate said device, a link connected with said slide, and mechanism actuated by a moving car connected with said link to reciprocate the slide, said mechanism arranged to have a free movement for a desired distance without actuating said slide, substantially as set forth.

7. In a switch-actuating mechanism, the combination with a switch-point, of a horizontally-oscillatory lever, a connecting-rod to connect the lever with the switch-point having an adjustable connection with the lever, and means to actuate said lever, the lever and the means to actuate the lever located the one above the other, substantially as set forth.

8. In a switch-actuating mechanism, the combination with a switch-point, of an oscillatory lever connected therewith, an inclosing case, a support for said lever within said case, a slide reciprocatory in said support, a dog upon said slide to actuate said lever, the lever and dog located the one above the other upon said support, substantially as set forth.

9. In a switch-actuating mechanism, the combination with a switch-point, an inclosing case, a support within said case, a slide reciprocatory in said support, an oscillatory dog carried by said slide, an oscillatory lever actuated by said dog, a connecting-bar connecting said lever with said point, a cross-bar connected with said slide, and springs connected with the extremities of said cross-bar located at the sides of the support, and means to actuate said slide, substantially as set forth.

10. In a switch-actuating mechanism, the combination with a switch-point, a horizontally-oscillatory lever, means to actuate said lever, a connecting-bar connected with said switch-point, and a slide having an adjustable engagement with the lever, said connecting-bar at the end opposite the switch-point connected with said slide, the lever and the means to actuate the lever located one above the other, substantially as set forth.

11. In a switch-actuating mechanism, the combination with a switch-point, of a horizontally-oscillatory lever connected therewith, a slide provided with an actuating device to engage and operate said lever, a tilting lever, a link connecting said tilting lever with said slide, an operating-lever to actuate the tilting lever, and means actuated by a moving car to actuate said operating-lever, said tilting lever having a free movement for a desired distance, substantially as set forth.

12. In a switch-actuating mechanism, the combination with a switch-point, of a slide, means to throw the switch-point into opposite direction from that occupied actuated by said slide, a link connected with said slide, a tilting lever connected with said link to actuate said slide, an operating-lever provided with an upwardly-projecting lug or shoulder and arranged to actuate said tilting lever, the tilting lever having a free movement for a desired distance, and arranged to be actuated by a moving car by a suitable device upon a moving car to throw the switch-point, substantially as set forth.

13. In a switch-actuating mechanism, the combination with a switch-point, a support, a slide having a reciprocatory movement in the support, an oscillatory dog carried by said slide, a cover for the support, and an oscillatory lever fulcrumed upon said cover above said dog, and connected with said switch-point, substantially as set forth.

14. In a switch-actuating mechanism, the combination with a switch-point, of an oscillatory lever to actuate said point, a reciprocatory slide, an oscillatory dog carried by said slide to actuate said lever, and means actuated by a moving car to actuate the slide, the means to actuate the slide having a free movement for a desired distance without actuating the slide, for the purpose set forth.

15. In a switch-actuating mechanism, the combination with a switch-point, of means to throw the switch provided with a connecting-rod, a tilting lever connected with said rod, and an operating-lever provided with an upwardly-projecting lug or shoulder to engage an operating device on a moving car arranged to actuate said tilting lever and throw it into operative position, substantially as set forth.

16. In a switch-actuating mechanism, the combination with a switch-point, of means to throw the switch provided with a connecting-rod, a tilting lever connected with said rod, an operating-lever provided with an upwardly-projecting lug or shoulder to engage an operating device on a moving car arranged to actuate said tilting lever, said tilting lever having a free movement for a desired distance before actuating said connecting-rod, substantially as described.

17. In a switch-actuating mechanism, the combination with a switch-point, means to actuate the switch-point provided with a connecting-rod, a tilting lever having a link connection with said connecting-rod, an operating-lever to actuate the tilting lever, a case in which the tilting lever and operating-lever are located, said operating-lever normally projecting upwardly above said case, and the tilting lever projecting normally flush with the upper face of the case, substantially as and for the purpose described.

18. In a switch-actuating mechanism, the combination with a switch-point, a horizontally-oscillatory lever connected therewith, a slide provided with an actuating device to engage and operate said oscillatory lever, and with a connecting-rod, a tilting lever having a link connection with said connecting-rod, an operating-lever to actuate the tilting lever, a case in which the tilting lever and operating-lever are located, said operating-lever normally projecting upwardly above said case, and the tilting lever projecting normally flush with the upper face of the case, substantially as and for the purpose described.

In testimony whereof I sign this specification in the presence of two witnesses.

SAMUEL NASH.

Witnesses:
N. STOUGHT,
M. HICKEY.