G. CAMPANA.

RAILWAY SWITCHING APPARATUS.

APPLICATION FILED JAN. 11, 1911.

1,042,197.

Patented Oct. 22, 1912.

3 SHEETS—SHEET 1.

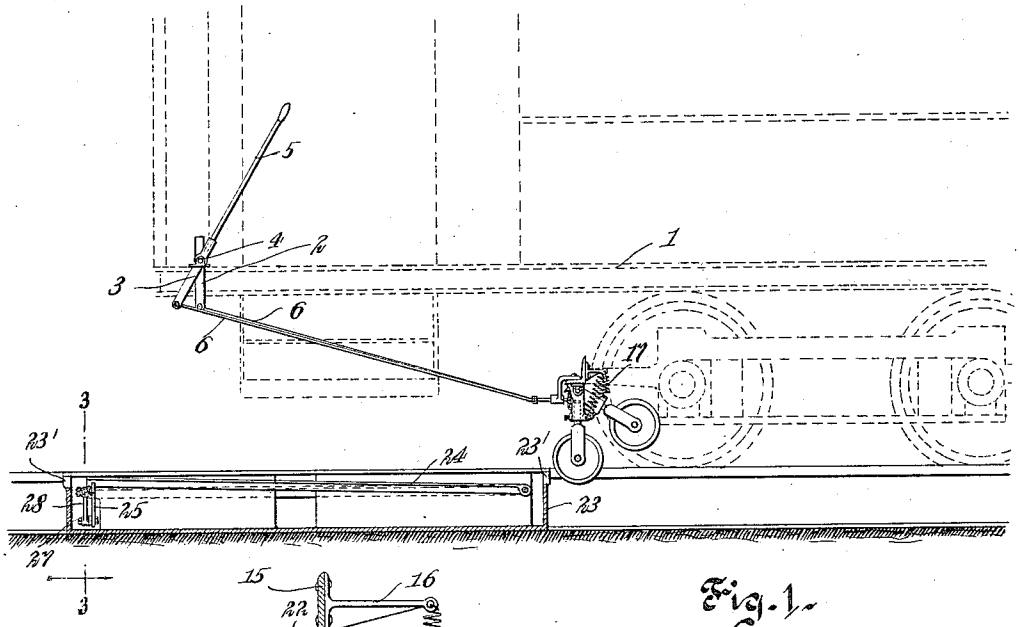

Fig. 1.

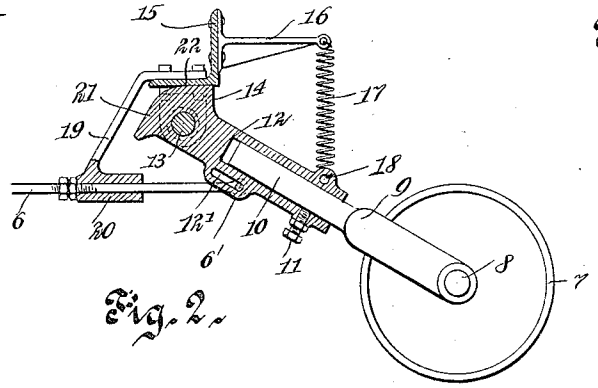

Fig. 2.

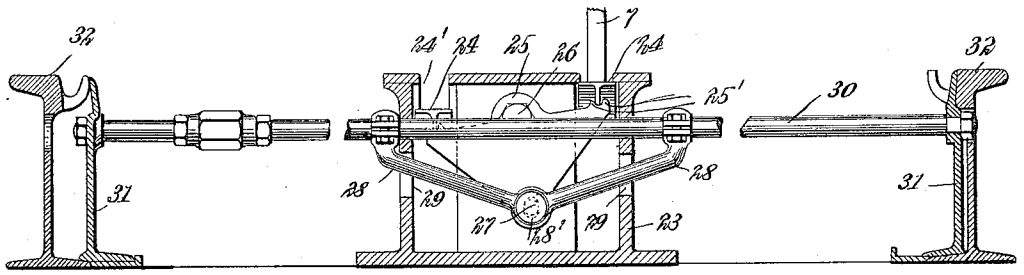

Fig. 3.

WITNESSES

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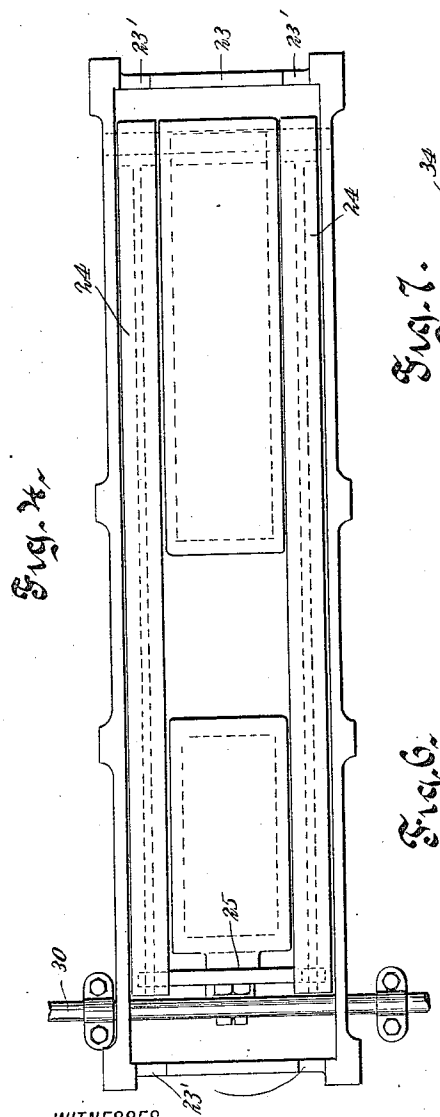


Fig. 4.

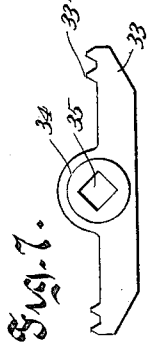


Fig. 7.

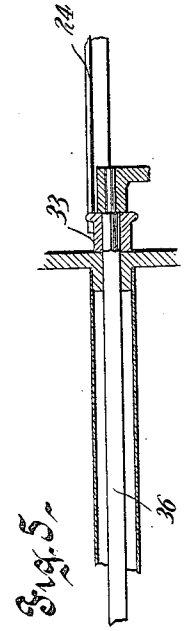


Fig. 5.

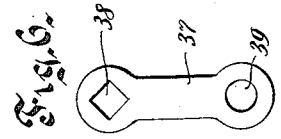
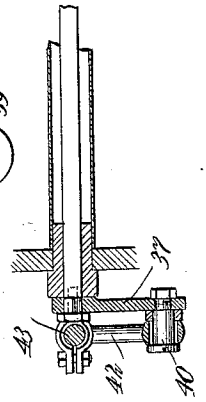


Fig. 6.



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3 SHEETS—SHEET 3.

Fig. 8.

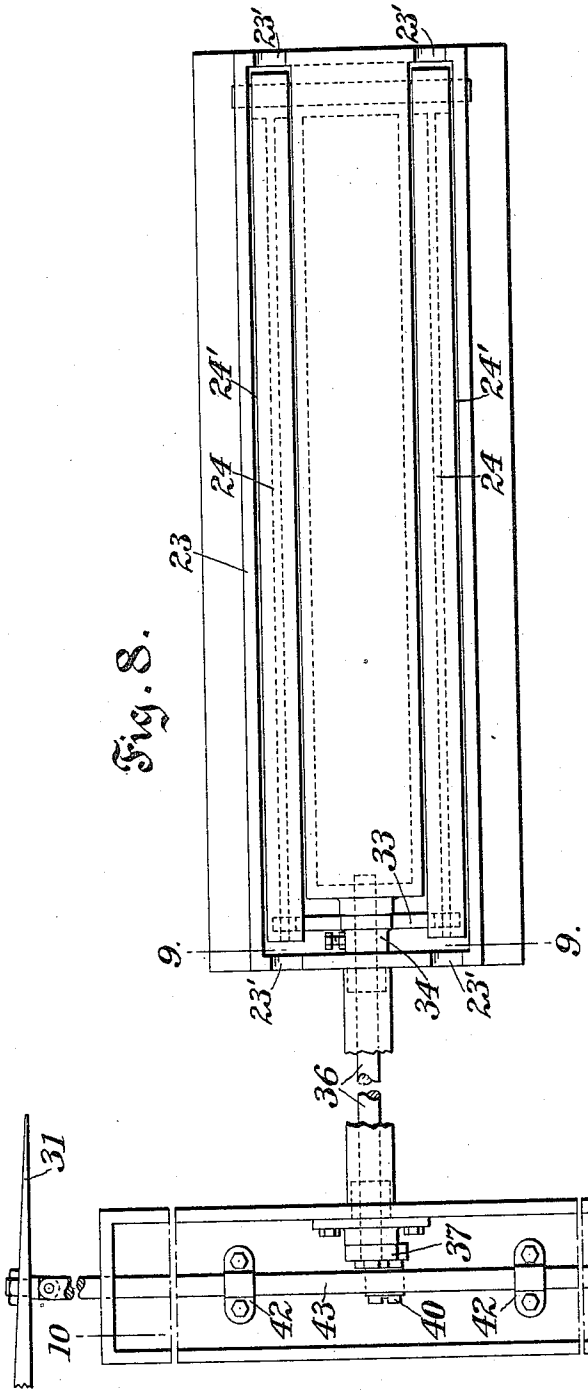


Fig. 10.

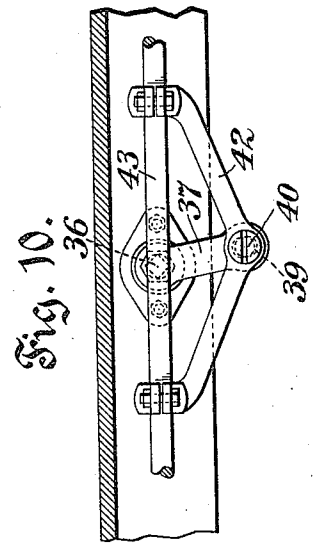
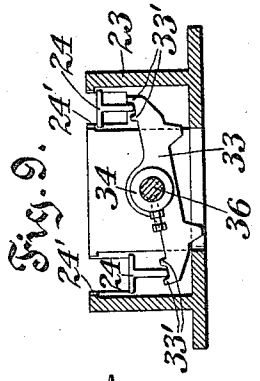


Fig. 9.



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UNITED STATES PATENT OFFICE.

GIUSEPPE CAMPANA, OF NEW YORK, N. Y.

RAILWAY SWITCHING APPARATUS.

1,042,197. Specification of Letters Patent. Patented Oct. 22, 1912.

Application filed January 11, 1911. Serial No. 601,943.

To all whom it may concern:

Be it known that I, GIUSEPPE CAMPANA, a subject of the King of Italy, and a resident of the city of New York, borough of Manhattan, in the county and State of New York, have invented a new and Improved Railway Switching Apparatus, of which the following is a full, clear, and exact description.

My invention relates to switching apparatus, and is intended to be used to advantage on railways of all kinds.

The object of the invention is to produce a practical device by means of which a switch along a line of track can be opened and closed by means of attachments which are carried on a car or train, and which are at all times under the control of the members of the train crew. These attachments cooperate with suitable actuating levers arranged along the track in advance of the switch, so that the switch will be opened or closed just before the car or train reaches the same, as conditions require.

By means of an apparatus adapted to obtain the above results it is unnecessary to stop the car or train in order to throw the switch, or even to slow down when the switch is approached, and it is also unnecessary to have a switchman or other track attendant on duty at the switch at the instant the car or train is passing.

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

Figure 1 is a side elevation showing the end of a car with my switch-operating apparatus attached thereto, and the switch mechanism actuated thereby; Fig. 2 is a side elevation, partly in section, of the switch-operating car attachments; Fig. 3 is a transverse sectional view on the line 3—3 of Fig. 1; Fig. 4 is a top plan of the box or casing in which the switch controlling levers actuated by the car attachments are mounted; Fig. 5 is a longitudinal vertical section showing an extension rock-shaft adapting the switch for operation by cars or trains going at a high speed; Fig. 6 is a detail of an arm which is actuated by the rock-shaft to throw the switch; Fig. 7 is a detail of a cross-arm by means of which the rock-shaft is actuated; Fig. 8 is a plan of the preferred form of the invention partly broken away; Fig. 9 is a vertical cross-section taken on the line 9—9 of Fig. 8; and Fig. 10 is a vertical cross-section taken on the line 10—10 of Fig. 8.

At the forward end of a car 1 are arranged two vertical levers 2 and 3, mounted pivotally on a horizontal spindle 4. These levers have sockets not illustrated formed in their upper ends to receive an operating arm 5, by means of which a member of the train crew can manipulate the switch-operating attachments. The lower end of each lever is pivotally connected to a rod or link 6, the opposite end of which is connected to and arranged to swing a roller 7 up and down in a vertical plane. These rollers 7 are carried preferably beneath the forward platform of the car or train and in advance of the forward wheels thereof. They are two in number and can be independently operated to be swung down into operative position, each by means of one of the levers 2 or 3. Each of the rollers 7 is mounted on a pin 8, carried by a yoke 9 which has a shank 10 held in position by means of an adjusting screw 11 in a socket formed in a pivoted arm 12. This arm is pivoted on a transverse horizontal spindle 13, mounted in downturned lugs 14, which are supported by means of a transverse angle-bar 15. This angle-bar 15 may be supported by connecting the same directly to the platform of the car 1, or in the manner shown, by connecting it in any suitable way to forward extensions from the front truck of the car.

The angle-bar 15 has brackets 16, to which are attached springs 17. Each spring 17 is also attached to an eye 18 near one end of the pivoted arm 12, and normally serves to hold the roller 7 out of operative position. Forward-extending brackets 19 are also carried by the angle bar 15, and each bracket has a guide bearing 20 formed at its lower end to receive the end of one of the aforesaid rods 6. These rods 6 are connected by bolts or pins 6′ with slots 12′ on the forward side of the arms 12.

The pivoted end of each arm 12 has two faces 21 and 22. The former face is normal or perpendicular to the longitudinal axis of the socket arm, while the face 22 makes an acute angle with the face 21. Both of these faces are adapted to fit tightly against the lower flat surface of the angle-

bar 15, so as to hold the socket member 12 in either operative or inoperative position. These faces 21 and 22 do not meet in an edge but are preferably rounded off, as shown in Fig. 2.

When one of the links 6 is pulled to lower the roller 7 into operative position, the tension of the spring 17 resists the movement of the member 12. When, however, the member 12 is moved far enough to cause the flat surface 21 to engage the under side of the bar 15, the roller 7 will remain suspended directly beneath the spindle 13 and will operate one of the switch levers when it reaches them. The levers 2 and 3 are of course locked to hold down the rollers securely.

In order to operate the switch points to open or close the switch, I employ a box or casing 23 arranged between the rails of the track, as shown in Fig. 3. This box or casing 23 has its longest dimension parallel with the direction of the track, and has two longitudinal slots or openings 24′ in its cover. Within this box or casing there is also mounted a pair of levers 24 on opposite sides thereof, these levers being pivoted at one end and being arranged with their pivoted ends away from the switch which is to be opened or closed. The levers 24 are preferably made of T-shaped angle-irons, and their upper flat faces, when the levers are raised, normally fit into the slots 24′ from below. The casing 23 has four notches 23′, two formed in each end at the corners thereof, so as to be in line with the levers 24 and form continuations of the slots 24′. These notches 23′ each permit one of the wheels or rollers 7 to pass therethrough and engage one of the levers 24. The downwardly-extending web of the levers 24 is received between lugs 25′ on the opposite ends of a triangular rocker 25, which is pivoted at 26 in the front end of the box or casing 23. The lower end of this triangular rocker carries a stud 27, which projects forward in the direction of the switch, and this stud 27 forms a means for connecting the rocker with a yoke 28. This yoke has a vertical slot 28′, which receives the stud 27, so as to allow the same a certain amount of play therein. The arms of the yoke 28 pass out through the sides of the box or casing 23 by means of apertures 29, and are connected at their outer ends to a transverse switch rod 30, which is connected at its opposite ends to switch-points 31, of suitable shape, which form the members of the switch above referred to coöperating with track rails 32.

In operation, when the car approaches a switch, one or the other of the rollers 7 is lowered to engage one of the levers 24. When the car arrives at the casing 23, the depressed roller engages the top of one of the levers 24 and passes along the same until its outer or unpivoted end is reached. This end is thus depressed, rocking the triangular member 25 around its pivot 26 and causing the lower end to transmit motion by means of the stud 27 to the yoke member 28. Hence, the rod 30 is longitudinally moved and the switch members 31 are shifted, as desired.

It will be understood that one of the rollers 7 will serve to shift the rod 30 so as to open the switch, in case the switch is to be opened, for the car that is approaching it, and the other roller 7 can be used to close the switch if conditions require that the switch should be closed. The rocker 25 and the mechanism controlled thereby are, of course, located in that end of the box or casing 23 which is nearest to the switch, while the pivots of the levers 24 are arranged in that end of the box 23 which is remote from the switch. It is unnecessary to stop the car, or even to slow down the same, in order to throw the switch into open or closed position as desired. All that has to be done by the train crew is to manipulate the levers 2 or 3 so as to lower into operative position, the proper one of the actuating rollers 7.

On high speed roads it is necessary that the switch-operating bar 30 be placed farther in advance of the train or car than on low speed roads. This is because a certain time is required to overcome the inertia of the switch-actuating mechanism, and if a car or train moving at high speed be permitted to approach as close to the switch-operating bar 30 as is shown in Fig. 1, for example, before one of the operating rollers 7 actually engages one of the levers 24, it may happen that the speed of the car will carry it past the switch before the switch-actuating mechanism in the casing 23 can be thrown into operation. Such a condition may cause the car or train to jump the track and lead to a serious accident. Consequently, on high speed roads I arrange the rocker member considerably in advance of the casing 23. A construction to answer the needs of high speed roads in this respect is shown in Figs. 5 to 10 inclusive. A rocker 33 is provided having a boss 34 with a square perforation 35 therein. This rocker member 33 has lugs 33′ at its opposite ends to receive the ends of the levers 24, the same as in the case of the rocker member 25. This rocker member 33 is mounted on the squared end of a suitable shaft or spindle 36, which is mounted in any suitable way on bearings between the track rails, and is in advance of the box or casing 23, in which the levers 24 are mounted. On the opposite end of this spindle 36, that is, the end nearest to the switch, is an operating arm 37, having a squared hole 38 to receive the squared end of the shaft or spindle 36. The

lower end of this arm has a round opening 39, in which is mounted a stud 40. This stud 40 is received by an aperture in a yoke member 42, and has a certain amount of play therein in the same way as the stud 27, shown in Fig. 3. The yoke member 42 is connected to a switch bar 43, which operates the switch points. By means of this construction the switch-actuating mechanism has plenty of time to respond to the action of the rollers 7, so as to throw the switch to open or shut position before the train or car reaches it, even though the train or car be traveling at a high rate of speed.

It will be understood that the rollers 7 with their controlling levers can be mounted at both ends of a car, so that the switches can be operated no matter which end is turned forward.

It will be obvious that such changes as come within the scope and spirit of my invention may be made when desired.

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

1. In an automatic switch, in combination, switch points, a switch bar connecting the same, a rocker member pivotally mounted having a sliding connection with the switch-bar to permit relative movement of the two and adapted to throw the switch points, arms rigidly connected to said rocker member, inclined bars resting freely upon said rocker arms and adapted to be depressed by a trip device on the car or train, and means for guiding said inclined bars in a vertical direction.

2. In an automatic switch, in combination, a track box having longitudinal slots in the upperside thereof, arranged between the track rails, inclined bars within said box at said slots, and pivotally supported, a single rigid rocker member supporting the elevated ends of said bars and switch points connected with said rocker member and actuated thereby.

3. In an automatic switch, in combination, a rocker having lugs in pairs on opposite sides of the pivotal axis thereof, a pair of inclined bars having their elevated ends resting on said rocker between said lugs, switch-points and means for connecting said rocker with said switch points to throw the same.

4. In an automatic switch, in combination, a single rocker member, a pair of inclined bars resting loosely thereupon on opposite sides of the pivotal axis, a pair of switch points, a switch-bar connecting the same, and a yoke pivotally connected loosely with said rocker and rigidly attached to said switch bar intermediate the switch rails.

5. A switching apparatus for railways comprising a switch, a switch-bar connected thereto, a yoke secured to the switch bar intermediate the switch rails, a rocker pivotally connected to said yoke, a casing containing the said rocker, levers mounted in said casing, extending longitudinally of said casing and engaging the rocker, rollers carried by a car or train to engage said levers and actuate the rocker to move the switch-bar to open or close the switch, and controlling levers carried by the car, by means of which either of the said rollers can be moved into or out of operative position.

6. A switching apparatus for railways, comprising switch rails, a transverse switch-bar connected to said rails, a yoke secured to the switch-bar intermediate the switch-rails, a rocker pivotally connected to said yoke for actuating said bar, a casing containing said rocker, levers mounted in said casing and operatively connected with said rocker, rollers carried by a car or train for engaging said levers to move said rocker to cause the switch bar to open or close the switch, and links and levers carried by the said car or train and connected to the rollers to swing the same into and out of operative position, said rollers being mounted in yokes having their ends received by pivoted socket members, said socket members having a loose pin and slot engagement with the said links and levers and said socket members each having intersecting surfaces adjacent its pivot point which are adapted to engage a flat surface carried by the frame of the car.

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

GIUSEPPE CAMPANA.

Witnesses:
A. M. MOLINA,
PHILIP D. ROLLHAUS.