

J BRUNTON.
Railway-Switch.

No 102,483.

Patented May 3, 1870.

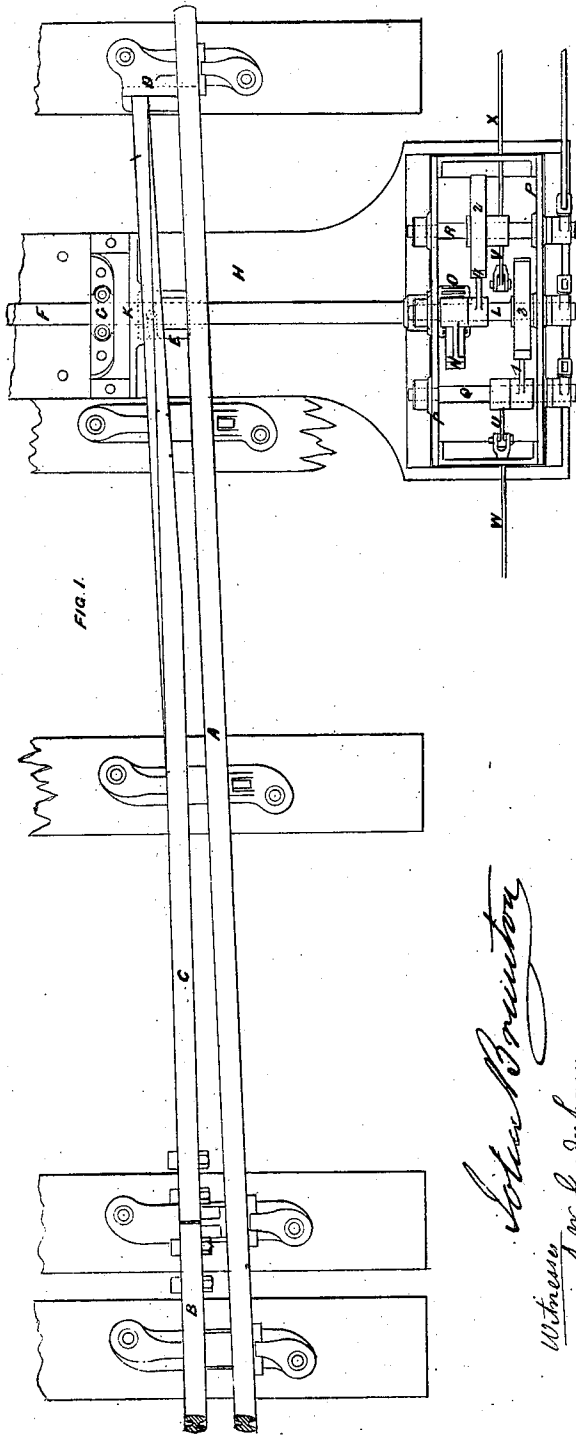


FIG. 1.

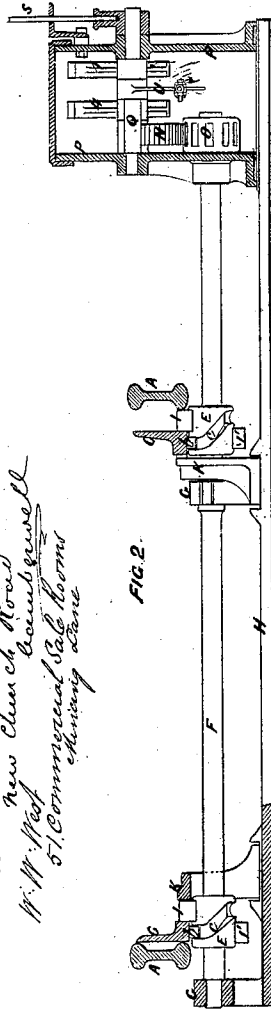


FIG. 2.

J. Brunton
 Witness
 J. W. Goodenham
 18 Victoria Street
 New Church Lane
 W. W. Peck
 57, Commercial Street
 London E.C. 4

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FIG. 3.

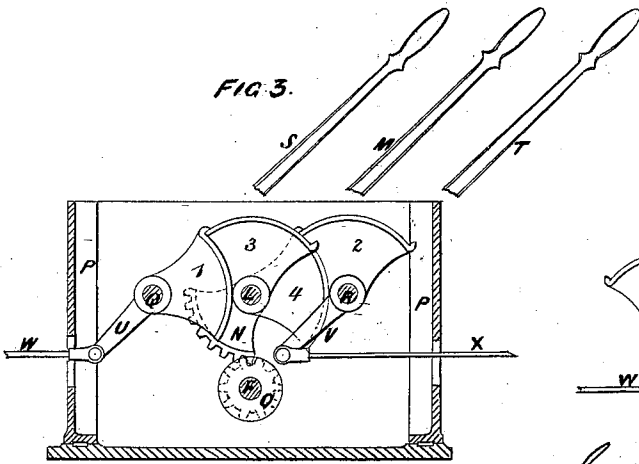
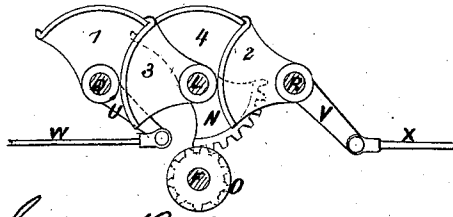


FIG. 4.



J. Brunton

Witnesses *J. W. Gooderham*
W. W. West

FIG. 5.

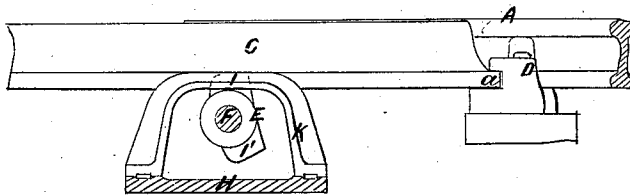


FIG. 6.

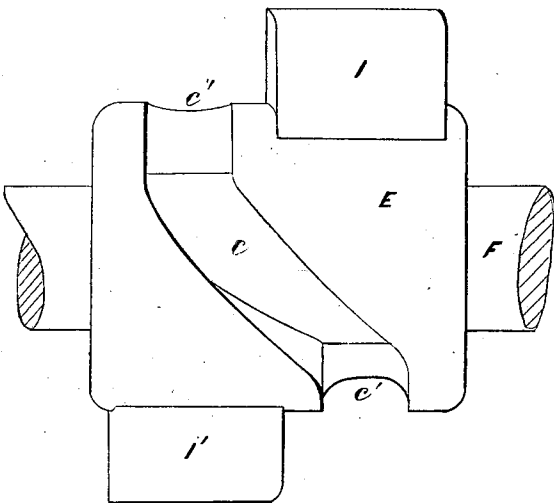
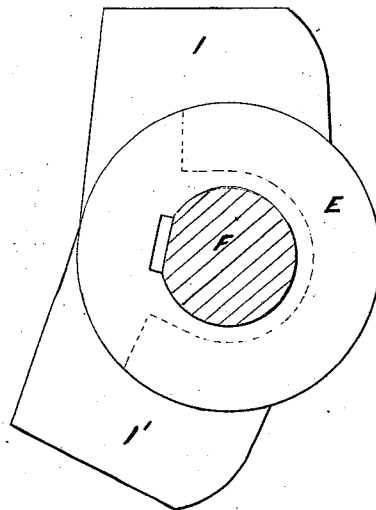


FIG. 7.



United States Patent Office.

JOHN BRUNTON, OF KENSINGTON, ENGLAND.

Letters Patent No. 102,483, dated May 3, 1870.

IMPROVEMENT IN WORKING AND LOCKING RAILWAY-SWITCHES AND SIGNALS.

The Schedule referred to in these Letters Patent and making part of the same

I, JOHN BRUNTON, of Kensington, in the county of Middlesex, England, civil engineer, have invented Improvements in Working and Locking Railway-Points and Signals, of which the following is a specification.

The objects to be attained by this invention are as follows:

First, that the switch or point, when either completely open or closed, shall be so fixed in its position that the vibration of the passing trains, even at high velocities, shall have no tendency or power to alter such position, and thereby either throw the passing vehicle off the line of rails or cause unpleasant and damaging jolts.

Second, that the signals, indicating the position of the points, shall be so arranged that it is out of the power of the pointsman to make any error, such as showing "Main line clear," while his points are open to the siding or branch, and *vice versa*.

Third, that the arrangement of the signaling and points-locking apparatus shall be such that each of the three movements necessary for the whole operation, viz: blocking the main line, moving the points, and opening the siding or branch, or *vice versa*, must be complete before the next movement can be made, and that the order or rotation of these movements cannot be interfered with by any carelessness on the part of the pointsman.

According to this invention, the switch-points or movable rail, which may be otherwise of the ordinary construction, is provided with a projecting stud on its under side, carrying an anti-friction roller, or not, as preferred, which works in a spiral groove, formed in a cylindrical scroll-cam mounted upon a rocking-shaft or spindle, which is placed transversely to the line of rails, and is actuated by a lever, or other convenient arrangement of mechanism.

The two extremities of the spiral groove terminate in a straight portion made directly in the path of rotation of the cam, and, consequently, imparting no motion to the switch-point or movable rail when its projecting stud enters therein.

Upon the periphery of the cam, and parallel with the two straight portions of the groove, are provided wedge-pieces or blocks, which project some distance from the surface of the cylindrical body of the cam, on or to which they are formed or secured, and bear against one side of the switch when in its open or closed position, thereby effectually locking it in its place, a bridge-piece serving as the abutment of the switch when open, and the side of the main rail as the abutment when shut. When using a movable rail, a special abutment will be provided for both ends of its traverse.

By making a portion of the groove straight, or in the direction of the circumference of the cam at each

end, the cam is permitted to rotate sufficiently to allow of the wedge-pieces being brought into or out of action before the switch-point or movable rail begins to move, or after it has been driven home by the cam.

In order to prevent the accidental lifting or rising of the end of the switch-point or movable rail, a T-headed stud or guide-pin may be fixed thereto, and work in a corresponding-shaped curved groove in the base-plate; or the toe of the switch-point or movable rail may be extended on the lower side, and work in a horizontal groove specially provided in the base of the chair.

Upon the cam or rocking-shaft above referred to there are keyed one or more segmental locking-pallets, or sectors, which interlock with corresponding sectors carried on a subsidiary shaft or shafts communicating with the main line, and branch, or siding-signals, in the usual manner, and actuated by a hand-wheel or lever, weighted or otherwise.

And, in order that the said invention may be fully understood, I shall now proceed more particularly to describe the same, and for that purpose shall refer to the several figures on the annexed sheet of drawings, the same letters of reference indicating corresponding parts in all the figures.

Figure 1, of the drawings, represents a plan, showing my improved arrangement of apparatus for actuating switches, points, or movable rails, and for locking or immediately fixing the same in their open and shut position, also the mechanism for interlocking the actuating mechanism of the points and signals of the main line and branch or siding;

Figure 2 is a transverse vertical section of the same, corresponding to fig. 1;

Figures 3 and 4 are detached sectional elevations of the interlocking mechanism;

Figure 5 is a detail, showing the mode of preventing the accidental rising of the toe of the switch-point or movable rail; and

Figures 6 and 7 are enlarged details of the cylindrical grooved cam, and its wedge projections or blocks for actuating and locking or fixing the switch-point or movable rail in its open and shut positions.

A A are the rails of the main line;

B B are the rails of the branch line or siding; and

C C are the switches, all of which may be secured in the usual manner by chairs.

The toe of each switch, at the lower part thereof, is extended, as shown at *a*, fig. 5, and slides to and fro laterally in a horizontal groove or channel cast in the side of the chairs D D, for the purpose of preventing any accidental rising of the pointed end of the switches.

These switches are, by preference, rolled with a base of equal, or nearly equal, breadth to the rails, and are provided on their under sides, near their

pointed ends, with a vertical stud or projection, *b*, fig. 2, carrying, or not, as preferred, an anti-friction roller, which works in a groove, *c*, made in a cylindrical cam, *E*. This groove is of a spiral form, for a portion of its length equal to the amount of traverse to be given to the switch, and terminates at each end in a straight portion, extending circumferentially round a portion of the circumference of the body of the cam, as will be clearly seen on referring to figs. 6 and 7.

Two of these cams are employed, situate one underneath each switch, and both keyed or otherwise secured onto a transverse rocking-shaft, *F*, which passes under the rails, and is supported in bearings *G-G* on the bed-plate *H*.

Each of the cams *E E* is provided with two wedge-pieces or blocks, *I I*, situate on one side of each of the straight portions of the groove *C C*, fig. 6, for the purpose of locking or fixing the switch in its open and shut position, after it has been adjusted by the partial rotation of the cam.

This fixing of the switch is effected by the forcible entrance of one or other of the wedge-pieces or blocks *I I*, either between the face of the switch and the main-line rail next to it, when the point is open, or between the foot of the switch and an arched abutment, *K*, bolted to the bed-plate, where the point is closed, as shown clearly in figs. 1 and 2, thus effectually preventing any accidental displacement of the switch after it has been adjusted.

If desired, the movement of the switches may be accomplished in the ordinary manner, in lieu of by a cam-groove, as described, and the switches may then be locked or fixed in position by the aid of the wedge-pieces or blocks *I I*, which, in that case, would be carried on plain bosses on the transverse rocking-shaft *F*.

This rocking-shaft *F* may be actuated either by a lever-handle, attached directly thereto, or, which I prefer, it may derive its motion from a subsidiary shaft, *L*, on which the point-lever *M* is mounted, such subsidiary shaft carrying a toothed segment, *N*, which gears into a pinion, *O*, fast on the shaft *F*. By this arrangement the arc through which the point lever has to move will be considerably reduced.

The subsidiary shaft *L* is carried in bearings in the sides of a closed box, *P*, which also contains the mechanism for actuating the main-line and branch or siding-signals, and for interlocking such mechanism with the points-actuating mechanism.

Q is the shaft for actuating the main-line signal, and *R* is a similar shaft for actuating the branch or siding-signal; these shafts are worked by the lever-handles *S* and *T*, respectively, and carry short lever-arms, *U* and *V*, which are connected to the signal-rods or wires *W* and *X*.

On each of the two shafts *Q* and *R* there is mounted a sector, indicated in my drawings by the numerals 1, 2, and on the subsidiary shaft *L* there are mounted two sectors, 3 and 4. The sectors of 1 and 3 are in the same plane, and interlock, the one with the other, while the sectors 2 and 4 are in another plane, and also interlock the one with the other. When the sev-

eral sectors are in the position shown more clearly in fig. 3, it is obvious that the sector 1 will prevent the sector 3 from moving, since its periphery bears against the end of the sector 3, while the sector 4 locks in the same manner the sector 2. Consequently, until the shaft *Q* and its sector 1 have been turned to their full extent by the signal-lever *S*, as shown in fig. 4, in order to block the main line, or show main line clear, as the case may be, the points which are worked from the shaft *L* cannot be moved, neither can the signal for the branch or siding be actuated, since the periphery of the sector 4, by bearing against the end of the sector 2, effectually locks the shaft *R*. So soon, however, as the sector 1 has been turned full over, as seen in fig. 4, then the sector 3 is free to move, and locks the sector 1 by bringing its periphery against the opposite end of that sector.

This movement of the sector 3, keyed on the shaft *L*, opens or closes the points, and unlocks, at the same time, the sector 2, which allows of the branch signal being actuated, but not until the points have been fully open or shut, and wedged or locked, whereupon the several sectors will assume the positions indicated in fig. 4. In figs. 1 and 3 the sectors are in the position they assume when the points are open to the branch or siding, the main line being blocked, and the branch-signal showing line clear, but in fig. 4 the points are closed to the branch or siding, the main-line signal showing line clear, while the branch line is blocked by the branch-signal.

A small raised lug or projection is formed on one end of each sector, to serve as a stop by coming in contact with a surface or periphery of the corresponding sector.

Claims.

1. The system or mode of actuating the switches, points, or movable rails of railway permanent way, and of locking the same in their open and shut positions by the aid of cams, or otherwise, in conjunction with wedge-pieces or blocks mounted upon one and the same rocking-shaft, substantially as hereinbefore described.

2. The use of a rocking-shaft and grooved cam for directly moving and actuating railway-switches, points, or movable rails, as hereinbefore described, the cam being located beneath, and directly connected with the switch or point which it actuates, as set forth.

3. The peculiar arrangement of interlocking sectors, whereby each of the three movements necessary for the whole operation, namely, the blocking the main line by signal-moving, and locking the points and opening the siding or branch by signal, or *vice versa*, must be completed before the next movement can be made, substantially as hereinbefore described.

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

JOHN BRUNTON.

Witnesses:

CHAS. MILLS,
F. W. ATKINSON.