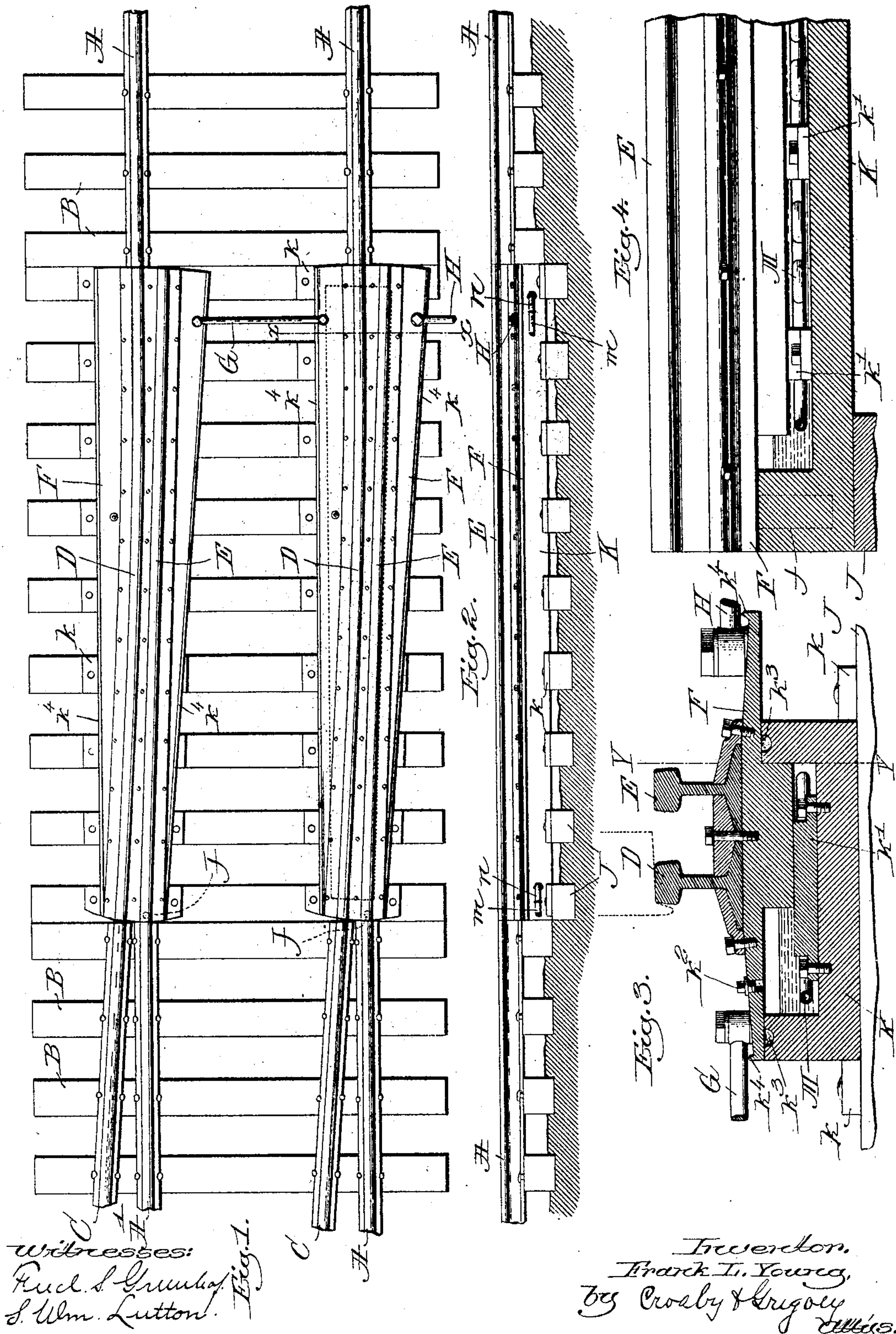


No. 803,514.

PATENTED OCT. 31, 1905.

F. L. YOUNG.  
RAILWAY SWITCH.  
APPLICATION FILED FEB. 2, 1905.





# UNITED STATES PATENT OFFICE.

FRANK L. YOUNG, OF BOSTON, MASSACHUSETTS.

## RAILWAY-SWITCH.

No. 803,514.

Specification of Letters Patent.

Patented Oct. 31, 1905.

Application filed February 2, 1905. Serial No. 243,784.

*To all whom it may concern:*

Be it known that I, FRANK L. YOUNG, a citizen of the United States, residing at Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Railway-Switches, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

10 This invention relates to a switch for railways, and in particular surface railways, where difficulty is experienced by reason of the accumulation of snow, ice, dirt, and other foreign substances between the parts of the switch, and in particular between the rails of the switch, rendering it difficult and at times impossible to secure the proper operation thereof.

20 The special difficulty in the operation of the ordinary forms of switch has been the accumulation of snow and ice in winter-time, which causes great trouble on the railways and throws the entire system of railway operation out of order.

25 This invention is designed to obviate these difficulties by providing a structure upon which snow and ice and other foreign substances cannot collect in such a manner as to prevent the operation of the switch, also in providing a construction whereby lubrication of the bearing of the switch is obtained, and also in providing means whereby in extreme cases heat may be applied.

35 The invention is applicable to various constructions and styles of switch and connecting rails in a railway-track. A simple and preferred form is shown in the accompanying drawings, and described herein; but it is obvious that save in so far as set forth in the claims the invention is not limited to any of the details of structure or particular relation of the parts illustrated.

45 The drawings represent a form of switch for connecting a main railway with a continuation thereof or with a branch railway, as desired, two switch-rails being provided for each connected rail.

50 In the drawings, Figure 1 represents in plan view a form of switch embodying the invention. Fig. 2 represents the construction shown in Fig. 1 in side elevation. Fig. 3 is a cross-section of a portion of the construction shown in Fig. 1, taken on the line *x x*. Fig. 4 is a cross-section of the construction shown in Fig. 3, taken on the line *y y*.

In the drawings, A A represent the rails of a railway-track mounted upon the sleepers B B in the usual manner. A' A' represent the rails of what may be termed the "continuation" of the main track, and C C represent the rails of what may be termed the "branch" track, all mounted upon the sleepers B B in the usual manner.

60 In order to switch a car from the track A A to the track A' A' or the track C C, or vice versa, it is necessary to connect the rails A A with either the rails A' A' or C C, as desired. These connected rails are here termed "switch-rails."

70 The switch-rail may be either single or double—that is, a single rail may be used for connecting, first, the rail A and the rail A', and, second, the rail A and the rail C; but it is preferred to make use of two switch-rails D E. In this manner a straight rail E may be employed for connecting the aligned rails A A', and a curved switch-rail D may be used for connecting the rail A and the branching rail C. This double form of switch-rail keeps the alinement of the track correct.

80 The switch-rails are mounted on a sliding switch-plate F, and the switch-plates are slid into proper position to connect the desired rails. This sliding movement may be accomplished in various ways; but it is preferable to pivot the switch-plates F at the point *f* in line with the end of the rail-sections A'. In this manner as the switch-plate F is swung about the center *f* the main rail A A' and its switch-rail E can be made continuous without a break, and the only place where any gap will occur will be between the rails C and the switch-rail D, which, owing to the slight distance between the main and branch rails at this point, will be very small.

95 The switch-plates F may be connected together for convenience of operation as by links G and operated by any suitable switch-operating mechanism. A link H is the only portion of the operating mechanism shown, as any suitable mechanism can be used for this purpose. A locking mechanism should also be provided for locking the switch-plate in place, and such signals as are desired for announcing the position of the switch and whether it is locked or not. It will thus be seen that from the construction shown of a switch-plate and switch-rails mounted thereon, which at the desired time come into alinement with the rails to be connected, there is



no opportunity for the accumulation of snow and ice and other undesirable substances in between the rails or movable parts of the track.

The free sliding movement of the switch-plate is secured by operating the bearings upon which the plate slides in a covered box containing a non-freezing liquid lubricant. In this manner the free movement of the switch is provided for, and it is impossible for the moving surfaces or the movable parts of the switch to become frozen or frozen in such a position as to prevent operation.

In the preferred form of construction illustrated a hollow switch-supporting box is provided beneath each switch-plate. The depth of the switch-box and its construction will depend upon the conditions under which it is used. By making the switch-rails of less height than the track-rails and by making the box shallow and where the load carried on the track is not extremely heavy the switch-supporting box can be placed in position without any material depression of the sleepers thereunder. In the preferred form illustrated, however, the sleepers J beneath the switch-supporting box are depressed to a sufficient extent. The sleepers below and adjacent the switch-supporting box should be very firmly set in position and preferably may be set in a bed of cement in heavy trackwork.

The switch-supporting box is shown at K. It consists of a flat bottom and vertical side and end walls and should be constructed liquid-tight and of sufficient strength to withstand the conditions of use. It may be fastened in place in any suitable way—as, for example, by projecting lugs  $k$ , bolted to the sleepers.

The sliding switch-plate F is arranged to form a cover for the switch-supporting box and is of such width as to form a cover for the box at whatever position it may be placed when slid to and fro, this being secured by extending the switch-plate sufficiently on each side.

The switch-plate has its bearing on the bottom of the switch-supporting box. Preferably the bottom of the box is formed with raised projections, whereby the friction of the sliding parts is reduced. These projections may take any suitable form, and, as shown herein, consist of flat bars  $k'$ , bolted to the bottom of the box  $k$ .

The interior of the box is preferably partially or substantially filled with a non-freezing liquid lubricant. By "non-freezing" is meant a liquid which will not freeze save at a very low temperature. An oil freezing at a temperature about  $30^{\circ}$  below zero will be found best for this purpose, and such an oil is well known and readily obtainable. This liquid lubricant, filling the box and covering the sliding surfaces, serves to prevent the freezing together of the parts, to keep them lubricated and causes the unhindered opera-

tion of the switch. The oil may be supplied as desired through a screw-capped hole  $k^2$ , but when once supplied will last for a long time.

The upper edges of the box are preferably formed with a groove in which is located an absorbent packing  $k^3$ . The movement of the switch will cause the lubricant to swash around more or less and get on all the surfaces. In this way the absorbent packing  $k^3$  will become saturated with the oil, and the movement of the cover upon the vertical edges of the box will take place readily and freely.

The longitudinal edges of the switch-plate F may be formed with small lips  $k^4$ , so that if any water collects upon the switch-plate it will tend to run off lengthwise rather than to drip over the edge and run toward the joint of the box.

The foregoing will be found a simple, satisfactory, and efficient switch, obviating the difficulties heretofore experienced and being unaffected by the accumulation of snow and ice and the prevalence of low temperature.

In some cases it may be found desirable to provide means for heating the switch and the liquid lubricant therein contained. A circulation of steam or water is insufficient for this purpose, because it freezes at such a high temperature. The present invention makes use of a circulation of oil at a heating temperature. This circulation may be secured in any desired manner; but, as herein illustrated, a series of pipe-coils M is located in each switch-supporting box in such a manner as not to interfere with the sliding switch-plates. Pipes  $m$  pass out from the box, elbows  $n$  being provided to prevent leakage, to a suitable pumping and heating supply, by which circulation of hot oil may be started and maintained when desired. In this feature of the heating means it is essential that a heating means be employed which when not in use shall be uninjured by cold. The oil system described is preferred as simple and economical; but the use of electrical heaters supplied by an electric current would be within the scope of the invention.

While the non-freezing liquid lubricant in the switch-supporting box constitutes a feature of this invention, still the switch under some conditions will be found to work well without this feature. In such cases the bearing parts may be oiled or lubricated, as in the case of machinery in general, if found necessary.

The construction of the switch-box with the sliding cover constituting the switch-plate, whereby the bearings are protected, is the essential feature of the invention.

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

1. In a railway-switch, a hollow switch-supporting box, a sliding plate forming a cover for said box in all positions of said plate and having its bearing upon the bottom of the



switch-supporting box, a non-freezing liquid lubricant in said box.

2. In a railway-switch, a hollow switch-supporting box, a sliding switch-plate having switch-rails mounted thereon, said plate forming a cover for said box in all positions of the plate, bearings for said switch-plate in said hollow box, a non-freezing liquid lubricant in said box.

3. In a railway-switch, a hollow switch-supporting box, a sliding plate forming a cover for said box in all positions of said plate and having its bearing upon the bottom of the switch-supporting box, a non-freezing liquid lubricant in said box, means for heating said liquid lubricant.

4. In a railway-switch, a hollow switch-supporting box, a sliding switch-plate having switch-rails mounted thereon, said plate forming a cover for said box in all positions of the plate, bearings for said switch-plate in said hollow box, a non-freezing liquid lubricant in said box, means for heating said liquid lubricant.

5. In a railway-switch, a hollow switch-supporting box, a sliding plate forming a cover for said box in all positions of said plate and having its bearing upon the bottom of the switch-supporting box, a non-freezing liquid lubricant in said box, means for heating said liquid lubricant comprising a pipe-coil located in said box and adapted to have heated oil forced therethrough.

6. In a railway-switch, a hollow switch-supporting box, a sliding switch-plate having switch-rails mounted thereon, said plate forming a cover for said box in all positions of the plate, bearings for said switch-plate in said

hollow box, a non-freezing liquid lubricant in said box, means for heating said liquid lubricant comprising a pipe-coil located in said box and adapted to have heated oil forced therethrough.

7. In a railway-switch, a hollow switch-supporting box, a pivoted sliding switch-plate with a switch rail or rails mounted thereon, said plate forming a cover for said box in all positions of said plate, bearings for said switch-plate to slide inside of said box, a non-freezing liquid lubricant in said box.

8. In a railway-switch, a hollow switch-supporting box having an absorbent packing around its upper edge, a sliding switch-plate forming a cover for said box in all positions of the plate, bearings for said switch-plate to slide upon inside of said box, a non-freezing liquid lubricant in said box.

9. In a railway-switch, a hollow switch-supporting box, a sliding plate forming a cover for said box in all positions of said plate and having its bearing upon the bottom of the switch-supporting box.

10. In a railway-switch, a hollow switch-supporting box, a sliding switch-plate having switch-rails mounted thereon, said plate forming a cover for said box in all positions of the plate, bearings for said switch-plate in said hollow box.

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

FRANK L. YOUNG.

Witnesses:

NATHAN HEARD,  
MABEL PARTELOW.