Oct. 24, 1939. W. S. NEWHALL 2,177,148

ADJUSTING DEVICE FOR RAILROAD SWITCH POINTS

Filed Oct. 22, 1937 2 Sheets-Sheet 1

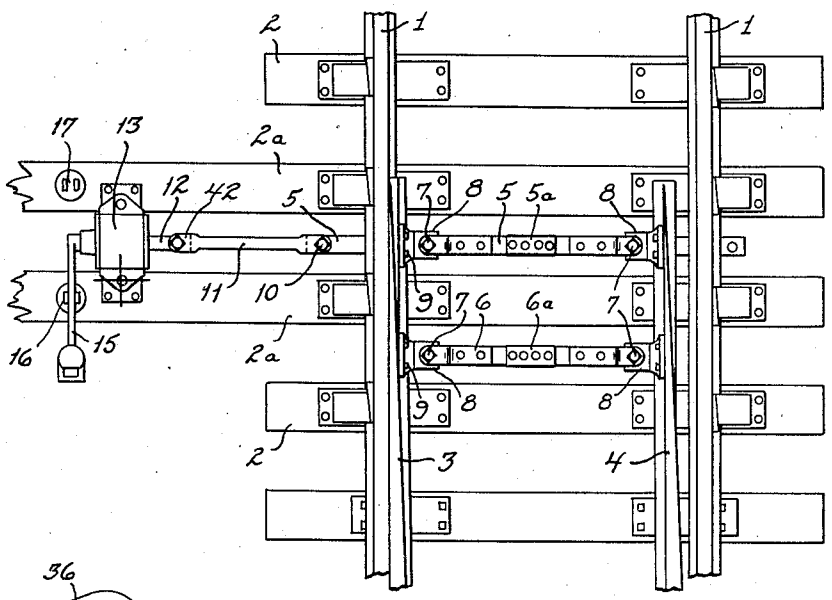


FIG. 1

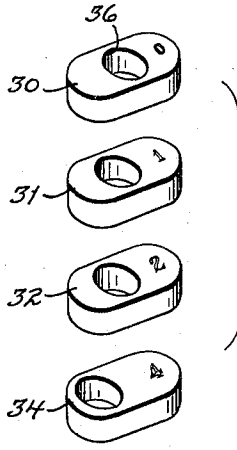


FIG. 3

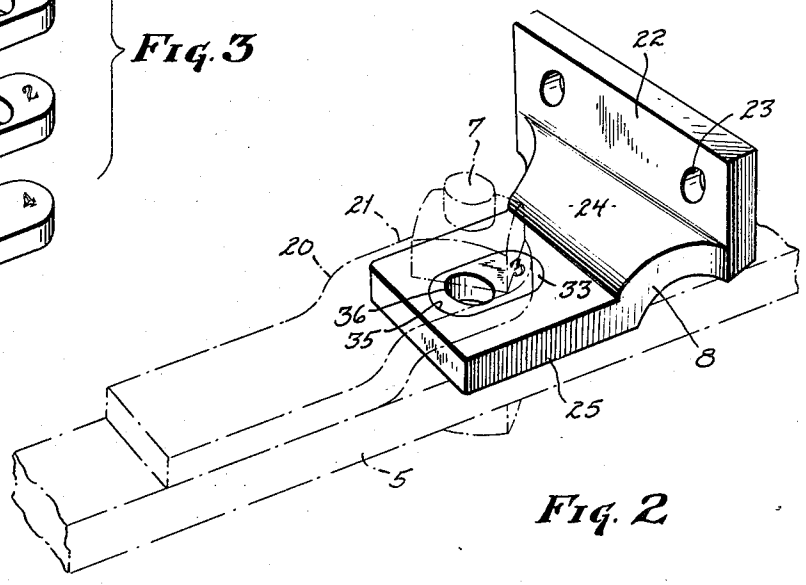


FIG. 2

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ADJUSTING DEVICE FOR RAILROAD SWITCH POINTS

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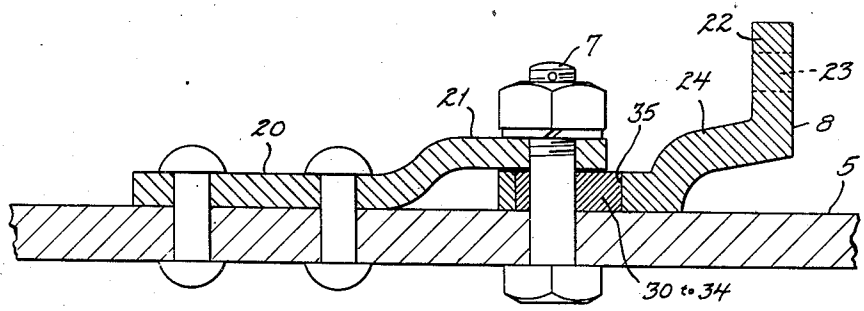


Fig. 4

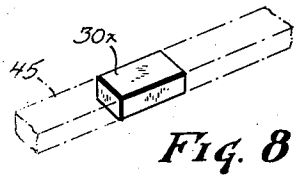


Fig. 8

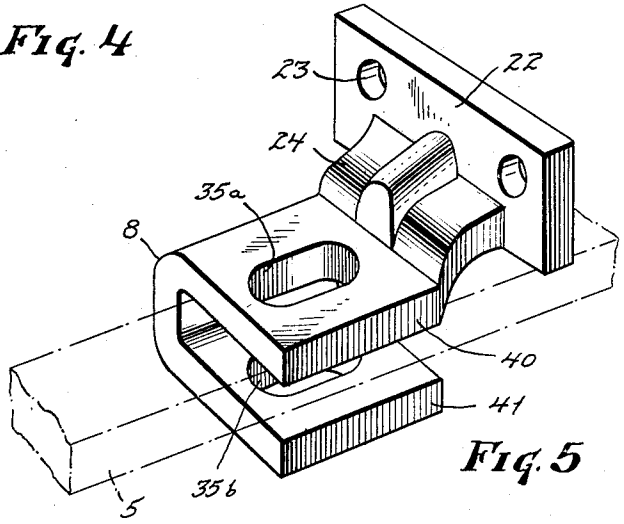


Fig. 5

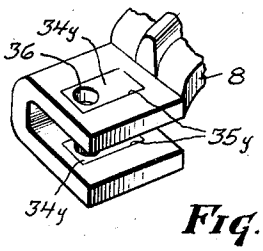


Fig. 9

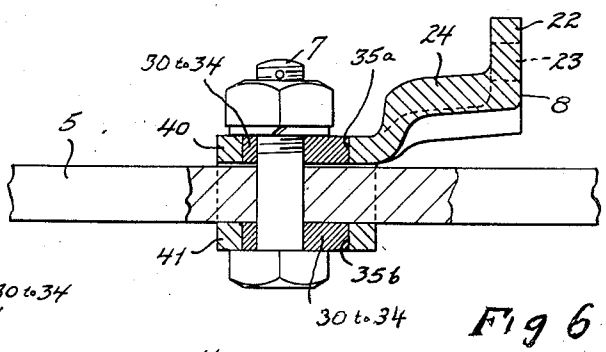
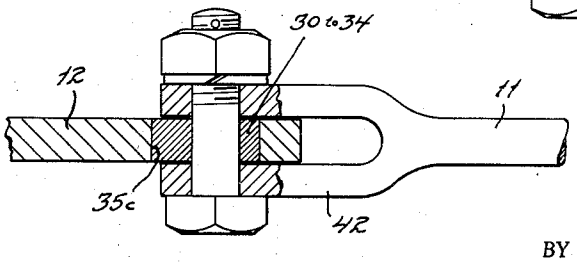


Fig 6

Fig. 7



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ADJUSTING DEVICE FOR RAILROAD SWITCH POINTS

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Application October 22, 1937, Serial No. 170,361

1 Claim. (Cl. 287—58)

This invention relates to railroad switches, and specifically to an adjusting means for the switch points. As illustrated, the invention comprises an adjusting device which is arranged for effecting the necessary adjustment in spacing the points properly in relation to each other, and in properly locating the two points as a unit with reference to the rails with which the switch is associated.

An object of the invention is to provide an adjusting device for railroad switch points, which will be simple and easy to manufacture and install, positively effective in operation, and which will conform to approved standards of railroad construction.

A further object is to provide an adjusting device for railroad switch points, which can be used without essential modification of present railroad switch construction to secure both types of adjustments mentioned above.

A further specific object is to provide an improved connecting device for switch point operating and/or connecting rods or links which will substantially minimize expense and waste in replacing parts when wear occurs at the attaching bolt holes.

Other objects and features of the invention will become apparent from the following description, relating to the accompanying drawings, showing the preferred form. The essential characteristics are summarized in the claim.

Referring further to the two adjustments mentioned, the adjustment of the points relative to each other, hereinafter termed adjustment *a*, is necessary, in order that the points, in their two positions shall be maintained definitely in contact with respective stock rails, and definitely spaced therefrom on the open side. The necessity for such adjustment, from time to time, arises because of wear on the rails and points and wear of the switch rod bolts or bolt holes. The other adjustment, which will be termed adjustment *b* is necessitated principally by wear of the switch stand mechanism and connections to the switch rod which ties the two switch points together. Adjustment *b* avoids having to respike the switch stand when the switch points as a unit get out of proper relationship to the stock rails.

At the present time the only approved means for effecting adjustment *a* is the so-called "transit clip". This construction comprises two forgings of angular section, secured to the respective switch points on their inner sides, each forging having a flat horizontal extension or flange provided with a series of holes located different distances from the switch point to which attached, so that the securing bolts for the rods may occupy selected pairs of holes spaced closer together or farther apart depending on the pair of openings selected. This arrangement is none too satisfactory, because when the holes in the horizontal flanges of the clips become worn, the clips have to be discarded and new ones put in their place, entailing considerable loss. Moreover, with the "transit clip" arrangement, it is possible for the switch rods to be disposed in diagonal relationship to the switch points or tracks, as when the attaching bolts occupy mismated holes in the two clips, whereupon the operating forces, in throwing the switch, are not transmitted in directions normal to the switch points, as is considered desirable for effective operation. With reference to adjustment *b*; turn-buckle or screw-and-yoke arrangements are usually used in the linkage between the switch rod and switch stand. The principal disadvantages of such adjusting devices are high cost, and rusting of threads.

The present arrangement, as will be demonstrated below, serves for effecting either type of adjustment in a very simple manner; is applicable economically to approved standards of construction; avoids excessive waste in replacement of parts when wear occurs at the bolt holes; is extremely unlikely to be subject to errors in effecting adjustments, and can be used to accomplish adjustment in definite steps such as small fractions of an inch.

Referring briefly to the drawings, Fig. 1 is a plan view showing sections of two rails comprising a track, supporting ties for the rails, a pair of switch points, and one type of switch stand mechanism with connections for shifting the switch points; Fig. 2 is a fragmentary perspective view showing a portion of a switch rod and a switch rod clip, embodying the invention in one form; Fig. 3 is a perspective view, showing a partial set of adjusting bushings, in accordance herewith (the remaining one of the set being illustrated in Fig. 2); Fig. 4 is a fragmentary view taken axially of the rod and clip, centrally through the adjustment device according to Fig. 2; Fig. 5 is a perspective view showing a side-jaw type switch rod clip; Fig. 6 is a longitudinal sectional view thereof attached to a switch rod, taken on a plane passing through the axis of the connecting bolt; Fig. 7 is a sectional view similar to Fig. 4 showing one manner of application of the adjustment to a slide bar of a switch stand and its connecting rod; Fig. 8 is a perspective view showing one manner in which making of blanks for the bushings may be simplified, and Fig. 9 is a fragmentary view

similar to Fig. 5 showing the installation of bushings made as suggested in Fig. 8.

Referring in detail to the drawings, first to Fig. 1, conventional stock rails 1 are shown as secured to the ties 2 in the usual way. The switch points indicated at 3 and 4 are connected, as shown, by two switch rods, 5 and 6. These are usually made of aligned bar sections coupled by insulating splice plates 5a and 6a. The rods are fastened as by removable bolts 7 to the switch rod clips 8, which are secured, as by bolts 9, to upright portions of the switch points 3 and 4 respectively. One of the switch rods (5 as shown) has pivotally secured to a laterally projecting end of it, as at 10, a connecting rod 11; the remote end of the connecting rod being adjustably secured to a slide bar 12 of a switch stand 13, as will later be described.

The switch stand may be of any suitable type. For instance, the stand may be in accordance with my patents, Nos. 2,054,758 and 2,054,759, issued September 15, 1936. The base of such stand is secured as by spikes, to tie extensions 2a of the ties 2, and the stand has an operating lever 15 which, through a suitable cam-operated or other mechanism, reciprocates the slide bar 12, to throw the switch points to their two operating positions, in accordance with the position of the lever 15. When the lever is positioned as shown (held by any suitable latch, such as indicated at 16) the switch point 3 is held firmly against one of the stock rails. In the opposite position of the lever 15, where it may engage a latch 17, the switch point 4 is held in firm contact with the other stock rail. Snug contact in each case is essential to proper operation of the switch.

Referring now to Fig. 2, wherein the present invention is shown as adapted for use in effecting adjustment *a*, it will be noted that the switch rod section shown is a straight rectangular bar, which has fastened to it, as indicated by broken lines at 20, a metal bar, whose cross section is approximately the same as that of the rod 5, and having one end portion 21 extending above the rod 5 in spaced relation to it, providing a yoke effect for receiving the clip. The switch rod clip shown is of the type which I term a "straight faced clip". This has an upstanding flange 22, provided with openings 23 to receive the attaching bolts 9 (Fig. 1), a curved portion 24, the underside of which provides clearance for the flange of the switch point and a horizontal shank or flange 25 of substantially rectangular section, which slidably fits in the yoke effect beneath the part 21.

Ordinarily, the horizontal flange or shank portion 25 of the clip has simply a cylindrical opening for receiving the attaching bolt 7, or in case it is a "transit clip" it may have a series of such holes, as previously mentioned.

The improvement hereof, as shown, comprises, in part, providing interchangeable bushings 30, 31, 32, 33 and 34, to receive the attaching bolt 7, which secures the clip to the switch rod. Figs. 2 and 3 between them show a complete set of bushings for effecting say one inch of adjustment at ⅛ inch intervals between the clip and the switch rod. These bushings may have identifying symbols marked on them as by dies, the symbols shown being 0 to 4. A lesser or greater number of bushings may form a complete set, assuming different adjustment intervals or different total adjustment ranges are desired. One set may be used for each switch rod clip or all the relative adjustment between the switch points (adjustment *a*) may be obtained at one clip, in which case the other clip might have simply a circular opening to receive the bolt 7.

The bushings 30, 31, etc., are made substantially to fit a non-circular (e. g. elongated) opening 35 in the flange or shank 25 of the clip, and each bushing has a round hole 36, which receives the bolt 7 (slide fit). The holes 36 are located differently in the different bushings, as will be explained below. Each bushing is of substantially the same height as the clip flange 25, so that it will vertically fill the opening 35 and prevent bending of either part 5 or 21 into the elongated opening should the nut of the bolt 7 be drawn down tightly enough to effect such bending.

To facilitate manufacture, the ends of the elongated openings 35 are circular (made, for example, by boring two holes and then milling out the material remaining between the two bored holes). The circular end surfaces are formed on radii, each of which is half the width of the opening; and the bushings are made slightly less in width and with circular ends on a similar but slightly shorter radius, so that the bushings may be slid easily into the opening. Preferably, each of the openings for the bushings has a total length of approximately two and one-half inches and a total width of one and one-half inches, the bushings being slightly smaller all around. Assuming the holes 36 in the bushings are slightly larger than the usual one and one-eighth inch diameter bolts, the approximate one and one-half inch width of bushings leaves adequate supporting stock on each side of the opening.

Referring to Fig. 3, it will be noted that the hole 36 of the bushing 30 (No. 0) is located at the longitudinal center of the bushing. The holes of the other bushings are off-center at increasing intervals, which, as indicated above, may be ⅛ inch each. With such increase, the hole in the bushing 34 (No. 4 bushing) would be one-half an inch off-center, and the set of five bushings would provide for a total of one-half inch of adjustment either way from the setting obtained by No. 0 bushing. Such one-half inch total adjustment each way is possible because, when installing the bushings, the off-center openings 36 may be placed at either side of the center of the elongated opening in the clip. In other words, bushings Nos. 1 to 4 may simply be reversed to obtain two different adjustments for each one. If the bushings are used at both clips of each rod, then a total adjustment either way of one inch can be made.

Usually the switch points are connected by two switch rods. The clips of each switch rod would, of course, be provided with the adjustment device herein described.

In order to replace bushings in making adjustments, the trackmen disconnect both switch rods from one of the points, as by removing the two bolts 7 associated with the clips of the switch point 3, Fig. 1, and then, either by means of the switch stand or by the use of a pinch-bar, relatively separate the two points sufficient to withdraw the switch rod members 21 from overlapping relationship to the clip shanks 25. Thereupon, the bushings 30 to 34 may be fished out of the elongated openings 35; or by springing the freed switch point (e. g. point 3) upwardly, the disconnected clip shank can be lifted off the adjacent switch rod a sufficient distance to permit the bushings to be removed downwardly,—in other words, driven out of the elongated open-

ings. The proper bushings to effect the adjustment are then placed in the elongated openings 35 in each switch rod, and the bolts 7 replaced from below.

The bushings are of sufficient size so that they are unlikely to be lost, and an adequate identified supply of each style (Nos. 0 to 4), can be carried on the usual hand-car.

In the event the railroad uses switch point clips of the type customarily referred to as "side-jaw-clips", an example of which is illustrated in Figs. 5 and 6 then preferably I provide elongated openings 35*a* and 35*b* in the two jaws 40 and 41 of such clips, and use two bushings at each clip for each adjustment; one in each of the elongated openings indicated. The switch rod, for use with side-jaw-clips, is simply a straight bar of rectangular cross-section, which is embraced between the two jaws, and ordinarily it is of insufficient width to permit slotting to receive the bushings, and leave enough stock on each side for adequate strength. Otherwise, it would be simpler to slot the rods for the bushings and use one bushing for each adjustment. I may, of course, slot the rods and use one bushing for each switch point attachment, when the rods are sufficiently wide.

The bolt 7, as in case of the straight faced clips, goes in from below the clip; and in order to replace the bushings, after removal of the bolt, the operator places the lower bushing on the bolt, inserts the bolt and bushing upwardly into the opening 35*b* in the lower jaw 41, shoves the bolt upwardly through the opening of the switch rod 5 and through the opening 35*a*, seating the lower bushing in 35*b*, and then places the upper bushing over the bolt and into the opening 35*a*. There is only one way in which the upper bushing can then go in; hence, if the lower bushing is properly located, the upper one is also. It will be noted that the head of the bolt and the nut or lock washer thereunder seat firmly against both the bushing and adjacent lower and upper surfaces respectively of the jaws 41 and 40.

In effecting adjustment *b* by means of the present arrangement (see Fig. 7), the non-circular openings for receiving the bushings may be provided either in the slide bar 12, as illustrated at 35*c*, or in the two arms of the yoke 42 of the connecting rod or link 11. The latter arrangement is not illustrated. Interchangement of bushings 30 to 34 in such non-circular or elongated openings 35*c* is accomplished as previously described in connection with Figs. 2 to 4. The arrangement obviates the necessity for expensive turn-buckle or threaded yoke adjustments such as usually used, and standardizes all the truly necessary adjustment operations in connection with railroad switch points.

Preferably, the sets of bushings for effecting adjustments *a* and *b* are identical, but special sets may be provided respective to the two adjustments if desired. If the series for adjustment *a* has openings spaced off-center at one-eighth inch intervals, then a total of one-half inch adjustment in each direction may be secured between the slide bar 12 and the connecting rod or link 11, as will be apparent from Fig. 7, taken in connection with the disclosures of Figs. 1 to 3.

In case shorter intervals of adjustments are desired for adjustment *b*, but with the same provision for total adjustment, then, of course, a larger number of bushings per set could be supplied for the arrangement illustrated in Fig. 7, but with, for example, $\frac{1}{16}$th intervals of change between holes 36 in the bushings. If greater total adjustment of the switch points as a unit should be desired, one could, of course, provide the adjustment bushings in keeping with the disclosure hereof at both ends of the connecting link 11.

When it is found convenient to form rectangular openings to retain the interchangeable bushings, blanks for such bushings may be made inexpensively from rectangular bar stock as suggested in Fig. 8 showing a blank 30*x* sawed or otherwise cut from a bar 45 (shown by broken lines). The bolt receiving holes are of course placed at different positions respective to the endwise centers of the different blanks which go to make up a complete set of bushings.

Two such modified bushings 34*y* with off center bolt holes are shown in Fig. 9, in place in respective rectangular openings 35*y* in the jaws of a side jaw clip. The openings 35*y* may be formed to size and shape in forging the clip or the rectangular formation of the openings may be obtained by a broaching operation. The manner in which rectangular openings such as 35*y*, and bushings to fit, could be provided in connection with switch point clips of other types,—or in the switch rods, connecting links (e. g. 11) or switch stand slide bars,—will be clear from the preceding description and illustrations referred to therein.

I claim:

An adjustable joint between two overlapping members connected by a transverse bolt, characterized in that the overlapping parts of the members are provided one with an elongated opening and the other with an opening substantially fitting the bolt, said elongated opening adapted to receive one of a set of bushings which interchangeably fit the elongated opening, each bushing having an opening which substantially fits the bolt and which is differently located with respect to the center of the bushing than the openings of the other bushings of the set, whereby said members may be relatively adjusted with respect to each other.

WALTER S. NEWHALL.