(No Model.)

A. HARLEY.

RAILROAD SWITCH STAND.

No. 261,814. Patented July 25, 1882.

Fig. 1.

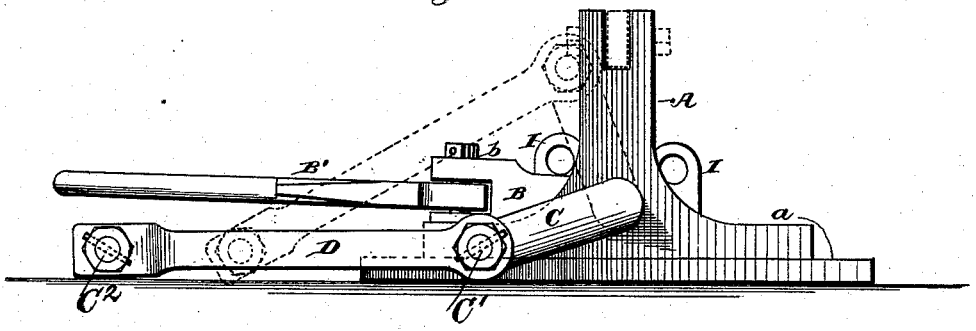


Fig. 2.

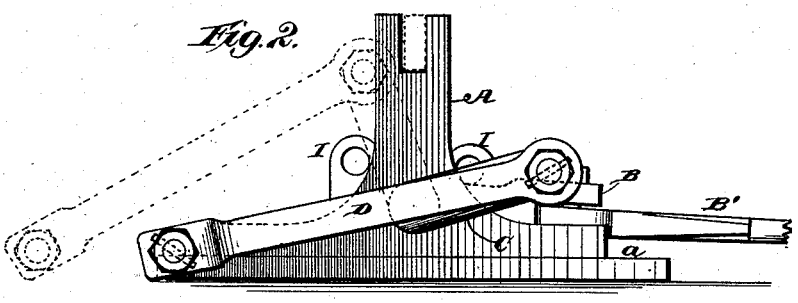


Fig. 4.

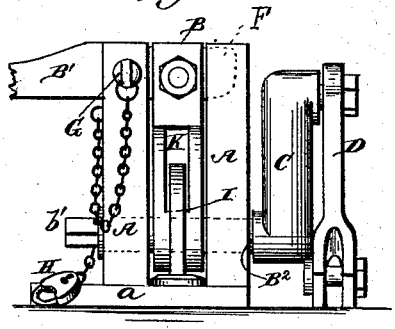
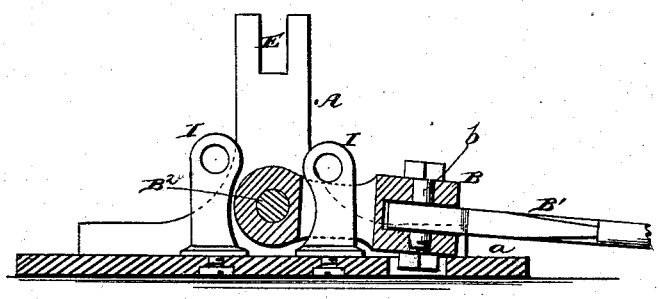


Fig. 3.



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UNITED STATES PATENT OFFICE.

ARCHIBALD HARLEY, OF TOPEKA, KANSAS.

RAILROAD-SWITCH STAND.

SPECIFICATION forming part of Letters Patent No. 261,814, dated July 25, 1882.

Application filed March 28, 1882. (No model.)

To all whom it may concern:

Be it known that I, ARCHIBALD HARLEY, a citizen of the United States, residing at Topeka, in the county of Shawnee and State of Kansas, have invented new and useful Improvements in Switch-Stands, of which the following is a specification.

This invention relates to an improvement upon the railroad switch-stand for which Letters Patent of the United States, No. 254,008, were granted to me on the 21st day of February, A. D. 1882.

The object of my present invention is to impart the same throw to the switch-rod by the movement or vibration of the switch-lever at either side of the switch-stand. This object I accomplish by the means illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of the railroad switch-stand with the switch-lever down at one side of the standards. Fig. 2 is a like view of the same with the switch-lever lowered at the opposite side of the standards. Fig. 3 is a vertical section, and Fig. 4 an end view.

The support for the rock-shaft of the switch-lever consists of two standards, A A, that are formed or provided with base-flanges *a*, and rigidly secured to a cross-tie or other suitable foundation by means of bolts or spikes passing through or otherwise applied to said base-flanges. These standards and flanges are arranged at a suitable distance apart, so as to leave a space between them for the switch-lever, which is composed of two parts, B and B′, jointed together by a pivot, *b*. The base-plate or foundation upon which the standards are secured has one of its edges flush with the outer side of that one of the standards thereof on the side of the apparatus at which the crank is located, so that when the crank is down, as in Fig. 1, the base will not interfere with the crank.

Upon one end of the rock-shaft B^2 of the lower part of the switch-lever, extending out from one of the standards, is secured a crank-arm, C, carrying at its outer end a wrist-pin, C′. The switch-rod D connects with this wrist-pin, so that when the switch-lever is operated by the switchman the fulcrum-pin, which is in rigid connection with said lever, will rotate about its axis, and thus turn the crank-arm and move the switch-rod, so as to shift the switch up to or away from the main track, as the case may be. The crank-arm is fixed upon the rock-shaft at an angle to the lower or inner section, B, of the switch-lever, so that when the latter is in a vertical position between the two standards the crank-arm will be in an inclined plane, as indicated by dotted lines, Figs. 1 and 2. If, now, the switch-lever is raised from the position shown in full lines, Fig. 1, where it is represented lying horizontally at one side of the standards, and is brought vertically between the two standards, the crank-arm and the switch-rod will assume the position indicated by dotted lines. If, now, the switch-lever is swung down at the opposite side of the standards, the crank-arm will be brought into the position shown in full lines, Fig. 2, and the same length of throw given to the switch-rod.

In operation the lateral movements of the switch-rails are affected not only by the rise of the crank-arm C from a horizontal to a vertical position, but also by the change of position of the switch-rod D from a horizontal to an inclined position, and the converse, since the horizontal distance apart of the crank-wrist C′ and the pivot or connecting-bolt C^2 at the other end of the switch-rod—that is to say, the horizontal distance apart of vertical lines drawn through the centers of the said crank-wrist and pivot or connecting-bolt—is less when the switch-rod is in an inclined position than when it is in a horizontal position, or, in other words, such horizontal distance is shortened by the change of the switch-rod to the inclined position. Therefore in my former invention this difference of the horizontal distances apart of the crank-wrist C′ and the pivot or bolt C^2 is added to the horizontal throw of the crank-arm to make the actual throw of the switch-rails. When moving the switch-lever from the track the crank-arm is raised from a horizontal position to a vertical position. On the contrary, when, still moving the lever from the track, the crank-arm is shifted from the vertical to the farther horizontal position, the said difference is subtracted from

the throw of the crank-arm to make the actual farther throw of the rails. Consequently the two throws of the rails are unequal by just twice that difference. To overcome such objection I construct the switch-lever and crank-arm, as shown and described, to diminish in a like amount the horizontal throw of the crank-arm in the first of its movements and increase it correspondingly in the second or farther movement, thereby equalizing the throws, as before stated.

I have made the same provision in this apparatus as in my former patented switch for holding and locking the switch-rod and switch in distinct positions. This is accomplished by the following means: When the switch-lever is turned so as to bring it into a vertical position between the two standards the upper part of said lever can be swung downward into a mortise, E, that is formed in the upper end of one of the standards. When said upper part of the switch-lever is thus rested horizontally in the seat or mortise of the standard the inner end of said part of the lever will project to some extent out from the mortise, which is at the joint of the two parts of the switch-lever. To provide room for this projecting inner end of part B′ of the switch-lever, and at the same time to render the apparatus as compact as possible, I form in the inner side of one of the standards a recess, F, which receives the said projecting end of the lever when the part B′ is swung down into a horizontal position, just described. To now hold the switch-lever in place I pass a jointed locking-pin, G, through holes in the switch-lever and the mortised upper end of the standard, and to secure the jointed locking-pin so that it cannot be accidentally or surreptitiously removed I provide a padlock, H, which can be locked onto the perforated point of the locking-pin. In this way the head at one end and the padlock at the other end of the locking-pin prevent the withdrawal of the same from the switch-lever and standard.

To prevent the padlock and the pin from being lost or taken away, I can connect them by chains with one of the standards. The switch and the switch-rod are brought into either of two other positions by lifting the outer end of the switch-lever from the mortise in the standard, and thereby straightening out the switch-lever, and then swinging the same down to the right or left of the standards. When the inner part, B, of the switch-lever is thus swung down to a horizontal position, the crank-arm upon its rock-shaft will be brought into a like position, and to hold the switch-lever down I provide the curved upright arms I I, located at the opposite sides of the fulcrum-pin of the switch-lever.

A mortise, K, is formed through the inner part of the switch-lever of sufficient size to receive either of the upright arms I when the lever is swung down in the manner last described. The upper end of each one of these arms has a perforation for the passage of the locking-pin, so that when the switch-lever is turned down by the switchman to the right or to the left one of the arms will pass through the mortise of the lever and project up above the same, so that the locking-pin can be passed through the perforation of the arm, and thereby hold the lever down. The padlock can then be applied to the locking-pin, as before described.

By the above construction and arrangement of parts a positive movement of the switch-rod is effected without any lost motion.

The base-rests for the switch-lever when it is turned down to the right or the left, the mortise or seat in the upper end of one of the standards, and the throw of the crank-arm are all so arranged that when the switch-lever is brought into position for switching the several rails will properly match.

The outer end of an arm that may be applied to one end b' of the rock-shaft B^2 can be provided with an appropriate signal, so that the engineer of an approaching train can readily determine the position of the switch.

If desired, a bevel-gear can be fixed on the end of the rock-shaft and located to engage a gear on a vertical shaft carrying a signal; or other means can be employed for operating such signal—as, for example, a crank and pitman—so that as the rock-shaft is turned the signal will be brought into proper position.

In conclusion, I will observe that in carrying out my invention the means hereinbefore described can be somewhat varied, and at the same time a like result attained—as, for example, the switch-lever and the crank might be arranged parallel with each other, and one of the arms I made higher than the other and adapted to stop the descent of the switch-lever before it reaches a horizontal position. The lower arm or stop will be at that side of the standards which is next to the track and from which side, when the lever and crank-arm are down, the switch-rod extends out from the crank-arm toward the track. Again, the standards could be formed so that when the switch-lever is raised so as to operate the crank and the switch-rod in order to match the rails, the lever can be locked in an inclined position on one side of the standards. It will be seen in all of these instances that the object is to so lock the switch-lever in a raised position that the crank-arm will have a longer horizontal movement at one side than at the other side of a vertical plane taken through the axis of the crank-wrist when the crank is in its elevated position and parallel with the same.

What I claim is—

The combination, in a railroad-switch, of the jointed switch-lever secured upon a rock-shaft, with the crank-arm connected with the switch-rod and fixed upon said rock-shaft at an angle to the lower or inner section of the switch-lever, whereby when the switch-lever

is brought into a vertical position the crank-arm will be in an inclined plane, and thereby admit of the same throw being given to the switch-rod when the switch-lever is vibrated at either side of the standards between which it is mounted, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

ARCHIBALD HARLEY.

Witnesses:
J. A. RUTHERFORD,
ROBERT EVERETT.