

E. H. STEEDMAN.
TONGUE SWITCH.
APPLICATION FILED APR. 25, 1912.

1,049,936.

Patented Jan. 7, 1913.

Fig. 1.

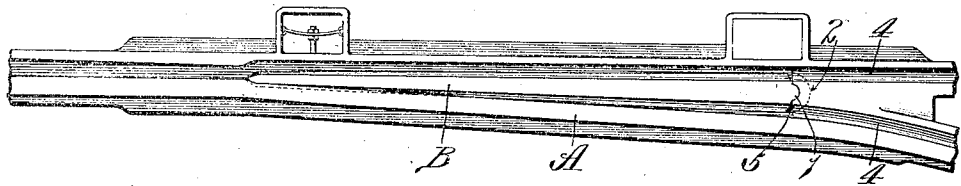


Fig. 2.

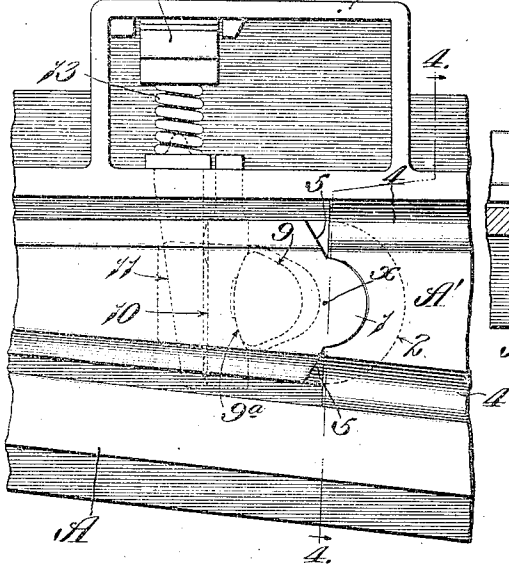


Fig. 3.

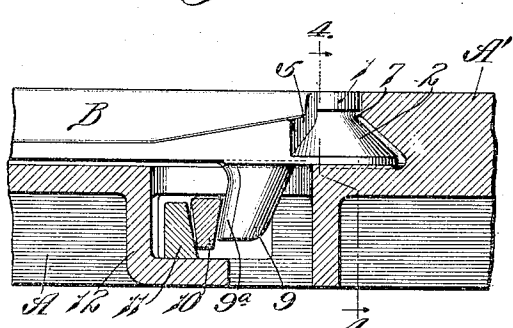


Fig. 5.

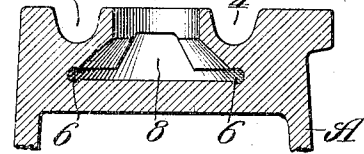
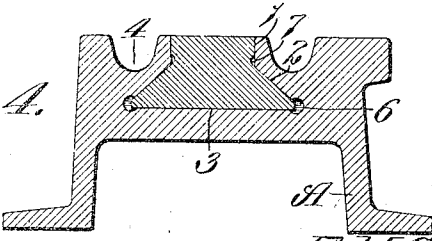


Fig. 4.



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UNITED STATES PATENT OFFICE.

EDWIN H. STEEDMAN, OF ST. LOUIS, MISSOURI, ASSIGNOR TO CURTIS & COMPANY MANUFACTURING COMPANY, OF WELLSTON, MISSOURI, A CORPORATION OF MISSOURI.

TONGUE-SWITCH.

1,049,936.

Specification of Letters Patent.

Patented Jan. 7, 1913.

Application filed April 25, 1912. Serial No. 693,142.

To all whom it may concern:

Be it known that I, EDWIN H. STEEDMAN, a citizen of the United States, residing at St. Louis, Missouri, have invented a certain new and useful Improvement in Tongue-Switches, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to railway switches, and particularly to tongue switches of the type described in my pending application Serial No. 615,070, filed March 17, 1911, wherein I have claimed broadly certain features of the switch described in my present application.

One object of my invention is to provide an inexpensive cast metal tongue switch that has all of the good qualities which are essential to a successful commercial switch, and which is so designed that there are no exposed portions on the sides of the tongue at the rear of the center of oscillation on which the flange of a passing wheel can exert lateral pressure and thus accidentally throw the tongue sidewise or produce what is commonly termed a "split switch."

Another object is to provide a tongue switch of the character above-described which is so designed that there are no knife edges or sharp thin portions on the body part of the switch which are liable to become broken when the switch is in use. And still another object is to provide a switch of the character described whose tongue is provided at its heel end with a semi-cylindrical-shaped pivotal portion and with a semi-conical-shaped pivotal portion, both of which fit in a pocket of corresponding shape in the body part of the switch, the upper end of the cylindrical-shaped portion of the tongue terminating at the running surface of the tongue and the base or bottom face of said semi-conical-shaped portion resting on a horizontal bearing surface or floor on the body part of the switch that extends rearwardly or back of the point on the tread surface of the tongue which a wheel first strikes in passing onto the heel end of the

Other objects and desirable features of my invention will be hereinafter pointed out.

Figure 1 of the drawing is a top plan view

of a tongue switch constructed in accordance with my invention; Fig. 2 is an enlarged top plan view of a portion of the switch; Fig. 3 is a longitudinal vertical sectional view taken through the center of the switch, the tongue being shown in elevation; Fig. 4 is a transverse vertical sectional view taken on a line indicated by the section lines 4-4 in Figs. 2 and 3; and Fig. 5 is a transverse vertical sectional view similar to Fig. 4 but with the tongue removed.

Referring to the drawings which illustrate the preferred form of my invention, A designates the body part of the switch, and B designates the oscillating tongue that is mounted on said body part, both of said members being preferably cast from manganese steel or some other suitable hard steel. The tongue B is provided at its heel end with two pivotal bearing surfaces, one consisting of a semi-cylindrical-shaped portion 1 whose upper end terminates at the running surface or tread surface of the tongue, and the other consisting of a semi-conical-shaped portion 2 whose base or bottom face rests upon a floor or horizontal bearing surface 3 on the body part A of the switch which is of greater width or diameter than the horizontal distance between the inner edges of the wheel flange grooves 4 in said body part. Said body part has a pocket that conforms to the shape of the semi-cylindrical and semi-conical-shaped pivotal bearing surfaces on the heel of the tongue and, as shown in Fig. 5, said pocket projects laterally underneath the wheel flange grooves 4. The cooperating pivotal bearing surfaces on the heel end of the tongue and on the body part of the switch are employed to restrain lateral forces which tend to move the tongue crosswise of the body part, and the horizontal bearing surface 3 on the body part which extends rearwardly or back of the point on the tread surfaces of the tongue which a wheel first strikes in passing onto the heel end of the tongue, is ample to support the vertical forces acting at the heel end of the tongue.

By constructing the switch in the manner above-described I distribute the downward forces over a relatively large surface and obtain sufficient bearing area at the heel end of the tongue to prevent wear which would

eventually cause the tongue to rock vertically, thus overcoming the possibility of the tongue tilting or cocking up when a wheel passes onto the heel end of same. The over-
 5 hanging wall on the body part A which embraces the semi-conical-shaped portion 2 on the heel end of the tongue, tends to hold the tongue firmly down on the horizontal bearing surface 3 provided for same when the
 10 tongue is forced back into the pocket in the body part, and as this portion of the pocket is located some distance below the tread surface or running surface of the body part the entire semi-conical-shaped portion 2 of the
 15 tongue is arranged below or in a lower horizontal plane than the bottom of the grooves 4 in the body part A which receive the flanges of the wheels, this feature being clearly illustrated in Figs. 4 and 5. The
 20 semi-cylindrical-shaped portion 1 on the heel of the tongue is of less width than the widest portion of the tread surface of the tongue and consequently the portion of the pocket in the body part A which receives said semi-
 25 cylindrical-shaped portion 1 does not merge or extend into the grooves 4 in the body part that receives the flanges on the wheels. In other words, the pivotal bearing portions 1 and 2 on the heel of the tongue and the
 30 pocket in the body part A which receives said portions are so designed that said pocket does not communicate with or merge into the wheel flange grooves 4 in the body part A, thereby eliminating sharp edges or
 35 comparatively thin fins on the body part A which might be liable to break when the switch is in use, the front face or end face of the portion A' of the body part in which the pocket is formed being vertical through-
 40 out its entire width, as shown in Figs. 2, 4 and 5. The walls of the pocket in the body part A completely incase or surround the part of the semi-cylindrical-shaped portion 2 on the heel of the tongue that lies at the
 45 rear of the center of oscillation x of the tongue, and as the part of said semi-conical-shaped portion which lies in front of the center of oscillation is located below or in a lower horizontal plane than the bottom of
 50 the wheel flange grooves 4, there is no possibility of the flange of a passing wheel exerting lateral pressure on the extreme heel end of the tongue and thus accidentally throwing the tongue sidewise or producing what is
 55 commonly termed a "split switch". To further reduce the possibility of the tongue being shifted sidewise accidentally by a passing wheel, I bevel off the portions 5 of the tongue that lie immediately in front of the
 60 portion A' of the body of the switch in which the pocket for the heel end of the tongue is formed.

In order to eliminate grinding and accurate finishing of the cooperating pivotal
 65 bearing surfaces of the tongue and body

part of the switch, I form a semi-circular-shaped recess 6 at the lower end of the pocket in the body part which receives the lower edge portion of the semi-conical-shaped part 2 on the heel of the tongue, and
 70 I also form a horizontally disposed groove 7 on the tongue at the junction of the semi-cylindrical shaped portion 1 and semi-conical-shaped portion 2, as shown in Figs. 3 and 4. If desired, a groove or recess 8 may
 75 be formed at approximately the center of the tapered wall of the pocket in the body part A for the same purpose, namely, to overcome the necessity of machining the portion 2 of the tongue and the cooperating surface
 80 on the body part so as to obtain a perfect fit. Means is provided for moving the tongue rearwardly so as to take up lost motion and wear between the cooperating pivotal bearing
 85 surfaces on the tongue and body part of the switch, and in practice the tongue and body part of the switch are so designed that the semi-cylindrical-shaped part 1 of the tongue does not fit snugly against the cooperating surface of the pocket in the body
 90 part when the switch is first installed, but if the semi-conical-shaped portion 2 wears after the switch has been in use for some time the semi-cylindrical-shaped portion 1 will bear upon the semi-cylindrical-shaped
 95 wall of the pocket which receives the portion 1 of the tongue. The semi-cylindrical-shaped portion 1, however, wears much faster than the semi-conical-shaped portion 2 on the tongue on account of the greater
 100 area of the portion 2 and consequently, a snug engagement or accurate fitting of the semi-conical-shaped portion 2 with the tapered wall of the pocket in the body part A of the switch is always insured.

The tongue B is provided on its under side with a depending lug 9 which is preferably formed integral with the tongue and arranged in such a manner that the conical
 105 surface 9^a on the front side of said lug is concentric with the axis of rotation of the tongue. The means herein shown for moving the tongue rearwardly so as to take up lost motion and wear consists of a bearing
 110 member or quarter-box 10 having a tapered curved surface that cooperates with the conical surface 9^a on the depending lug on the tongue, and a wedge-shaped locking device 11 for holding said bearing member in
 115 engagement with said lug and causing it to exert rearward and downward pressure on said lug and tongue. The lug 9, quarter-box 10, and device 11 are arranged in a housing 12 on the under side of the body
 120 part A of the switch, and a coiled compression spring 13, or some other suitable means, is provided for exerting pressure on the wedge-shaped device 11 so as to automatically take up any lost motion or wear between the cooperating bearing surfaces on
 130

the tongue and body part or between the quarter-box 10 and the lug 9 on the under side of the tongue. The spring 13 is preferably arranged between one end of the wedge-shaped device 11 and a spring-seat 14 carried by a bracket 15 on the body part A of the switch, and the inclined face of said wedge-shaped device 11 which bears against the housing 12 is formed at such an angle that the wedge will not be forced outwardly or become accidentally displaced by any pressure which the lug 9 might exert on the quarter-box 10 when the switch is in service. Various other means might be employed, however, for locking the tongue B in operative position and forcing it rearwardly so as to take up wear and therefore I do not wish it to be understood that my invention is limited to the means just described for retaining the tongue in operative position. In view of the fact that it is not necessary to machine or accurately fit a number of cooperating surfaces on the tongue and body part of the switch the switch can be manufactured at a low cost from manganese steel or other suitable hard steel castings, and when the switch is repaired a new part will fit in a used part without re-grinding or shaping the surfaces of the used part.

A switch of the construction above-described can be cast from manganese steel or other suitable hard steel with minimum trouble and expense in the foundry and assembled into a working switch without other finishing than is usual on castings in a foundry, such, for example, as removing gates and fins and grinding off rough lumps, and therefore it can be manufactured cheaply. It is safe because there are no exposed portions on the heel of the tongue lying at the rear of the center of oscillation on which a passing wheel can exert side pressure and thus throw the tongue sideways accidentally; and furthermore, the tongue of such a switch cannot tilt or cock up when a wheel passes onto same on account of the relatively large horizontal bearing surface 3 on the floor of the switch on which the bottom face of the semi-conical-shaped portion 2 of the tongue bears.

In addition to the desirable features above-mentioned a switch of the character previously described is exceptionally strong and durable because there are no knife edges or thin sharp portions on the body part A of the switch which are liable to become broken.

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

1. A tongue switch comprising a tongue, a body part provided with grooves for the wheel flanges, a tapered portion on the heel of the tongue whose lower end is wider than

the horizontal distance between the inner edges of said wheel flange grooves, and a pocket in the body part for said tapered portion arranged between said grooves and in such a manner that it does not intersect or merge into same.

2. A tongue switch comprising a tongue, a body part provided with grooves for the wheel flanges, a tapered portion on the heel of the tongue, a pocket in the body part for said tapered portion that projects laterally underneath said wheel flange grooves, said pocket being arranged in such a manner that it does not intersect or merge into the wheel flange grooves, and means cooperating with said tongue that tends to force the tongue rearwardly so as to hold the tapered portion thereon snugly seated in said pocket.

3. In a tongue switch, an oscillating tongue, a body part provided with grooves for the wheel flanges, an approximately semi-conical-shaped portion on the heel end of the tongue whose base or horizontal bearing surface is of greater diameter than the distance between the inner edges of said wheel flange grooves, a pocket in said body part for said semi-conical-shaped portion arranged in such a manner that it does not intersect or merge into said grooves, a horizontal bearing surface on said body part on which said semi-conical-shaped portion bears, said surface extending rearwardly or back of the center of oscillation of the tongue, and means for retaining the tongue in operative position in said body part.

4. In a tongue switch, an oscillating tongue, a body part provided with grooves for the wheel flanges, an approximately semi-conical-shaped portion on the heel end of the tongue whose lower end portion projects laterally under said grooves, a pocket in said body part for said semi-conical-shaped portion arranged in such a manner that it does not intersect or merge into said grooves, a horizontal bearing surface on said body part on which said semi-conical-shaped portion bears, said surface extending rearwardly or back of the center of oscillation of the tongue, and means which tends to move the tongue rearwardly so as to take up lost motion or wear between said semi-conical-shaped portion and the walls of the pocket in said body part.

5. In a tongue switch, a tongue, a body part provided with grooves for the wheel flanges, and a curved pivotal bearing portion on the heel end of the tongue fitting in a pocket in said body part and provided with a horizontal bearing surface which is wider or of greater diameter than the horizontal distance between the inner edges of said wheel flange grooves, said pocket being arranged in such a manner that no portion of the curved pivotal bearing surface on the

tongue can be engaged by the flange of a passing wheel.

6. In a tongue switch, a tongue, a body part provided with grooves for the wheel flanges, a curved pivotal bearing portion on the heel end of the tongue fitting in a pocket in said body part and provided with a base portion which is wider than the distance between the inner edges of said grooves, said pivotal bearing portion being so arranged that no part of same can be engaged by the flange of a passing wheel, a lug depending from the tongue, and means cooperating with said lug to hold the curved bearing portion on the tongue in its pocket and also prevent the tongue from moving upwardly.

7. In a tongue switch, a tongue, a body part provided with grooves for the flanges of the wheels, a pocket in said body part whose upper end terminates at the wheel-tread surface of said body part and whose lower end projects laterally underneath said wheel flange grooves, said pocket being so disposed that it does not communicate with or merge into said grooves, and a curved pivotal bearing portion on the heel end of said tongue fitting in said pocket and formed in such a manner that the flange of a passing wheel cannot exert lateral pressure on same.

8. In a tongue switch, a tongue, a body part provided with grooves for the flanges of the wheels, a pocket in said body part whose upper end terminates at the wheel-tread surface of said body part and whose lower end terminates below said grooves and projects laterally under same, said pocket being so disposed that it does not communicate with or merge into said wheel flange grooves, and a curved pivotal bearing portion on the heel end of said tongue fitting in said pocket and formed in such a manner that there are no exposed side portions of same located at the rear of the center of oscillation of the tongue.

9. In a tongue switch, a body part, an oscillating tongue mounted therein, a semi-cylindrical-shaped portion on the heel end of the tongue whose upper end terminates at the running surface of the tongue, a concentric semi-conical-shaped portion on the heel end of the tongue arranged below said semi-cylindrical-shaped portion with its smaller diameter upward, a pocket in said body part that receives said semi-cylindrical and semi-conical-shaped portions, a horizontal bearing surface on said body part for the under side of the tongue that extends rearwardly or back of the center of oscillation of the tongue, and means cooperating with the tongue to hold the cooperating surfaces on the heel end of the tongue and in said body part in snug engagement.

10. In a tongue switch, a body part having a portion in which a pocket is formed,

the front face of said portion being substantially straight and extending transversely of the switch, a tongue mounted on said body part and provided at its heel end with a tapered pivotal bearing portion that fits in said pocket, the lower end or under side of said tapered pivotal bearing portion being of greater width than the tread surface of the tongue, and beveled surfaces on the sides of the tongue that form clearances between the tongue and the front face of the portion of said body part in which said pocket is formed.

11. In a tongue switch, a body part having a portion in which a pocket is formed, the front face of said portion being substantially straight and extending transversely of the switch, a tongue mounted on said body part and provided at its heel end with a tapered pivotal bearing portion that fits in said pocket, the lower end or under side of said tapered pivotal bearing portion being of greater width than the tread surface of the tongue, beveled surfaces on the sides of the tongue that form clearances between the tongue and the front face of the portion of said body part in which said pocket is formed, a depending lug on the under side of the tongue, and means cooperating with said lug to prevent the tongue from moving upwardly and for forcing the tongue rearwardly so as to take up wear and lost motion between the pivotal bearing surfaces of the tongue and body part.

12. In a tongue switch, a body part having flange-ways for the flanges of the wheels, a floor on said body part arranged at a lower level than the bottom of said flange-ways, an oscillating tongue arranged in a recess in said body part and provided on its under side with a depending lug that projects downwardly through said floor, said lug being located adjacent the heel end of the tongue but at a point in front of the center of oscillation of the tongue, a pivotal portion on the heel end of the tongue located back of the center of oscillation and extending upwardly from said floor to the running surface of the switch, the upper end of said pivotal portion intersecting said running surface in a semi-circle of much less diameter than the horizontal distance between the inner edges of said flange-ways at the center of oscillation of the tongue, and the lower end of said pivotal portion, which rests upon said floor, having a diameter that is only slightly less than the horizontal distance between the outside edges of the flange-ways in said body part at the center of oscillation, thus giving the tongue a large bearing surface on the floor of the body part at the rear and sides of the exposed running surface of the tongue, a pocket in said body part for the pivotal portion on the tongue which is not inter-

sected or cut by the flange-ways in the body part, and means coöperating with the depending lug on the tongue to force the tongue rearwardly into said pocket and to take up wear and lost motion between the coöperating pivotal bearing surfaces on the tongue and body part.

In testimony whereof I hereunto affix my signature in the presence of two witnesses, this 19th day of April, 1912.

EDWIN H. STEEDMAN.

Witnesses:

J. H. STEEDMAN,

T. U. RUMBLEY.