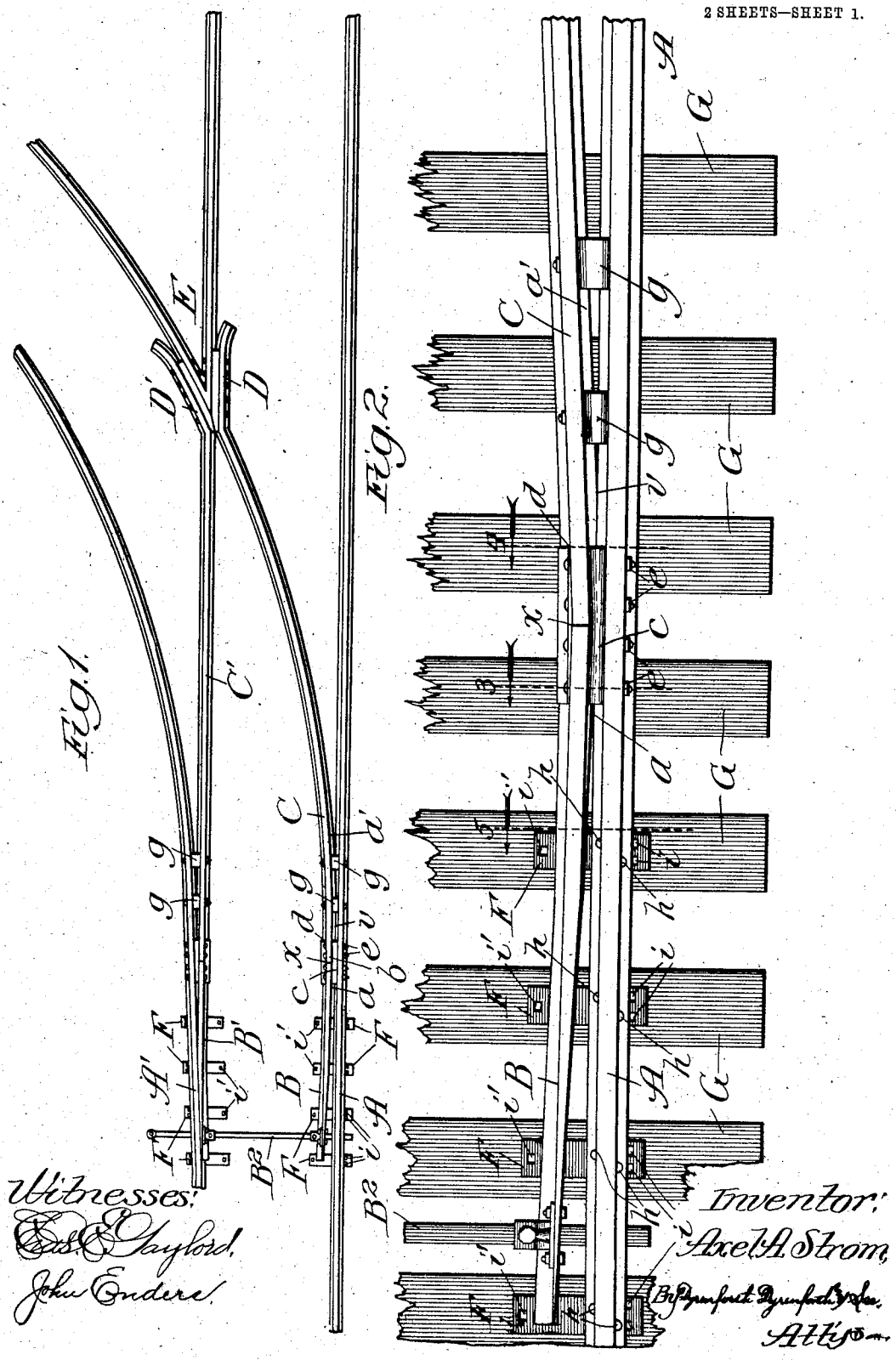
No. 790,010. PATENTED MAY 16, 1905.

A. A. STROM.

RAILWAY SWITCH CONSTRUCTION.

APPLICATION FILED MAR. 6, 1905.

2 SHEETS—SHEET 1.



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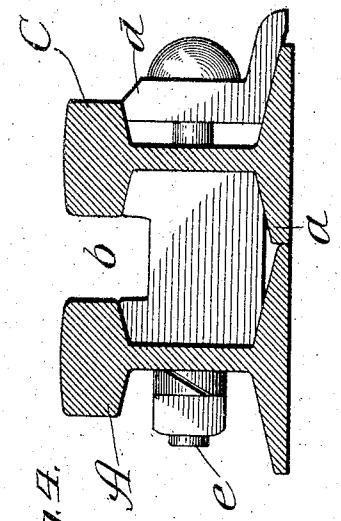

Fig. 4.

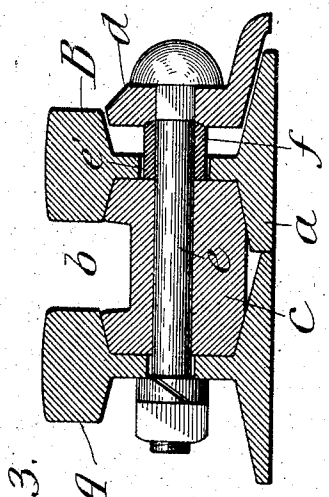

Fig. 3.

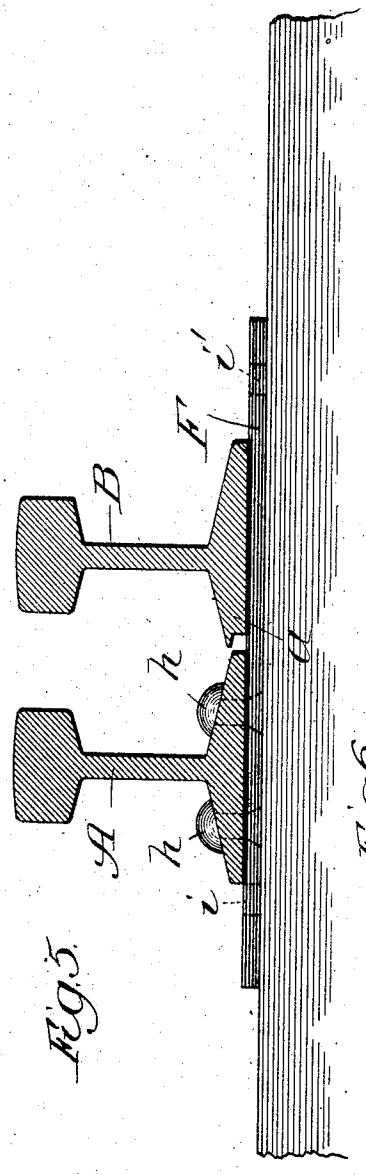

Fig. 5.

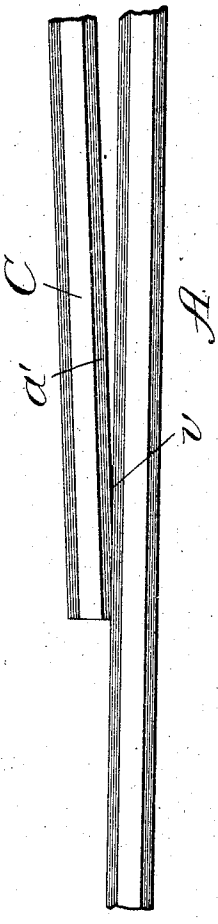

Fig. 6.

Witnesses:
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John Enders.

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Att'ys.

No. 790,010. Patented May 16, 1905.

UNITED STATES PATENT OFFICE.

AXEL A. STROM, OF CHICAGO, ILLINOIS, ASSIGNOR TO PETTIBONE, MULLIKEN & COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

RAILWAY-SWITCH CONSTRUCTION.

SPECIFICATION forming part of Letters Patent No. 790,010, dated May 16, 1905.

Application filed March 6, 1905. Serial No. 248,469.

To all whom it may concern:

Be it known that I, AXEL A. STROM, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Railway-Switch Constructions, of which the following is a specification.

My invention relates to an improvement in the construction of the split-switch variety of railway-switches employing T-rails for producing it.

The construction employed hitherto of the kind of railway-switch to which my improvement relates involves of necessity an undue length of point-rails for present conditions of railway equipment. The point-rails cannot be spiked down like the other rails in the track, and since the introduction of the modern long and heavy high-speed locomotives upon railways the long lengths of the point-rails employed in these switches have rendered them especially dangerous, owing to their liability to loosening and fracture under the enormous strains to which they are subjected by these long and heavy locomotives in running over them, particularly when running at high speed.

The length of point-rail required for any split switch is determined by the angle of the frog and the combined width of the opposing flanges of the point-rail at its heel end and the main rail with which it coöperates to form the clearance or space for the flanges of the locomotive drive-wheels, both the point-rail at its heel portion and the main rail with which it so coöperates being of their full cross-sectional dimensions, and thus forming a wheel-flange space considerably wider than the minimum width thereof required for passage of the wheel-flanges, which is one and three-quarters inches, and this excessive width of wheel-flange space increases with rails of greater cross-sectional areas. Obviously, the greater the cross-section of the rails employed the longer the point-rails must be to coöperate with their respective main rails. The lengths of point-rails used under the conditions referred to vary between the shortest length of about ten feet and the longest of about thirty feet, according to the angle of the frog, all of these lengths being standard, though the length most used is fifteen feet.

The primary object of my invention is to reduce the length of the point-rails to the minimum compatible with the requirement relative to the clearance-space for the locomotive drive-wheel flanges between each main rail and the heel of its coöperating point-rail where the latter meets the adjacent end of a lead-rail or rail extending from the frog, thereby to obviate the danger referred to, since the shorter the point-rail can be made the greater will be the reduction in the danger to travel from its being loosened and broken under the great strains to which it is subjected, as aforesaid. Moreover, the shorter point-rails reduce the cost of manufacture and that of the maintenance and repairs of switches.

By my improvement the lengths within the range referred to may be reduced about one-half, length for length, the only limitation to its application being the required observance of the minimum or approximately minimum wheel-flange space, whereas the limitation requiring observance where the coöperating rails are, as heretofore, of full cross-section is arbitrary, varying with difference in the dimensions of the T-rails employed.

I accomplish my aforesaid object of enabling the point-rails to be shortened, broadly stated, by reducing to the minimum or approximately the minimum required the width of flange space or clearance for the flanges of locomotive drive-wheels between each point-rail where it meets the rail from which it proceeds or "lead-rail" and the adjacent main rail.

My further object relates to strengthening the switch structure by providing the slide-plates for the point-rails as permanent attachments on the bases of the main rails to adapt the latter to be spiked down upon the ties along their inner sides beyond the point-rails as well as along their outer sides.

Referring to the accompanying drawings,

Figure 1 is a plan view of a complete railway-switch equipment represented without regard to any particular scale for the purpose of identifying parts hereinafter referred to; Fig. 2, a similar view showing only one side of the switch constructed in accordance with my improvement and drawn to a scale adapting it to illustrate the same, but which precludes representation of the entire switch equipment within the limitations of the sheet; Figs. 3, 4, and 5 are sections taken, respectively, at the lines 3, 4, and 5 on Fig. 2, viewed in the direction of the arrows and enlarged; and Fig. 6 is a broken plan view showing a main rail and the adjacent lead-rail with its outer flange reduced in width by beveling toward the rail end to adapt it to lie against the edge of the inner flange of the main rail.

In Fig. 1, A and A′ are the main rails, the latter describing a curve. B and B′ are the point-rails, connected by the usual or any suitable head-rod device B^2. C is the curved lead-rail, conforming to the curve of the rail A′ and from the forward end of which the point-rail B proceeds, and C′ is the straight lead-rail, parallel with the rail A and from the forward end of which the point-rail B′ proceeds, the lead-rails extending, respectively, from the wing-rails D and D′ of a frog, the point of which is represented at E. In Fig. 2 only the rails A, B, and C are shown, the point-rail B representing a length of seven feet, with the required throw at its free extremity; but with the assistance of Fig. 1 my improvement will be readily understood by those skilled in the art from the following description, mainly with reference to Fig. 2, since the relation of the point-rail B′ to the rails C′ and A′ is structurally the same as that of the point-rail B to the rails C and A. The bevel along the outer side of the tapered switch-rail begins at the extremity of its heel portion there to reduce the width of its flange *a* where it contacts with the adjacent main-rail flange to produce the minimum width of wheel-flange space *b*, or instead of cutting away the flange *a* along the edge of the heel portion of the point-rail it may be caused there to overlap to the required extent the flange of the adjacent main rail. The lead-rail C is extended along the main rail A to meet at *x* the point-rail B, and to adapt it to coincide throughout its cross-sectional area therewith the outer flange *a*′ of the rail C is beveled off from the point *v* to the extremity of the rail, and the lead-rails are lengthened to meet the point-rails to the extent of shortening the latter. In this way the abutting ends of the two rails B and C may be set to the minimum or approximately minimum permissible one-and-three-quarters-inch distance of separation of their heads at *x* from the head of the main rail A to afford the flange-space *b*, as represented. The rail C and the point-rail B are fastened together and to the rail A, preferably in the manner and by the means illustrated, comprising a heel-block *c* and a splice-bar *d*, crossing the joint at *x*, and through which bar, the necks of the rails B C, the heel-block, and the neck of the main rail A bolts *e* are inserted. Where the foremost bolt *e* (shown in Fig. 3) passes through the neck of the point-rail the opening *e*′ is enlarged to receive a thimble confined between the block *c* and bar *d* to permit to the point-rail near its heel end a slight lateral yield along the thimble in throwing the switch to avoid undue strain on the point-rail in springing it. At intervals between each rail C and C′ and its adjacent main rail spacing-blocks *g* are interposed for their bracing function as substitutes for spikes, which it is not practicable to drive where the rails are so close together. So much of the described switch construction as involves the two main-rail sections, the lead-rails, and the two point-rails proceeding from the lead-rails may best be made at the works ready to be placed in a railway-track. By reason of the construction to this extent of the switch equipment as a whole at the works opportunity is afforded for permanently fastening to each main rail at suitable intervals the slide-plates F for the point-rails, and this I do by riveting each slide-plate, as at the points *h h*, to the base of a main rail through its flanges, thereby rendering each main rail and its slide-plates practically integral, with the material advantage of enabling the main rails to be spiked to the ties G not only along the outer sides of the rails through holes *i* in the outer end portions of the plates, but also along their inner sides beyond the point-rails through spike-holes *i*′ in the inner end portions of the plates, thus spiking the main rails along their inner sides without obstruction from the spike-heads to the movements of the point-rails. This union of the main rails and slide-plates may be employed to advantage in any construction of split switch other than that herein shown and described, and my improvement involving the short-point-rail feature of the switch may be embodied in forms other than the particular form herein set forth, so that I do not intend to be understood as limiting my invention to that particular form of its embodiment.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a railway-switch formed of T-rails, the combination with the main rails, of point-rails, each formed of a single piece set at their heel portions relative to the main rails to form therewith approximately the minimum permissible width of wheel-flange spaces, and lead-rails meeting and corresponding in cross-sectional area with the heel ends of said point-rails, for the purpose set forth.

2. In a railway-switch formed of T-rails, the combination with the main rails, of point-rails, each formed of a single piece set at their

heel portions relative to the main rails to form therewith approximately the minimum permissible width of wheel-flange spaces, and lead-rails beveled toward their ends along their outer flanges to lie against the inner main-rail flanges and conform at their ends to and meet the heel ends of the point-rails, for the purpose set forth.

3. In a railway-switch formed of T-rails, the combination with the main rails, of point-rails, each formed of a single piece set at their heel portions relative to the main rails to form therewith approximately the minimum permissible wheel-flange spaces, lead-rails meeting and corresponding in cross-sectional area with the heel ends of said point-rails, and spacing-blocks interposed between the lead and main rails, for the purpose set forth.

4. A railway-switch formed of T-rails, having the main rail, point-rail and lead-rail of each side of the switch secured together at the heel portion of the point-rail and there forming approximately the minimum permissible wheel-flange space, for the purpose set forth.

5. In a railway-switch formed of T-rails, the combination with the main rails, of point-rails, shorter than standard lengths thereof, set at their heel portions relative to the main rails to form therewith approximately the minimum permissible width of wheel-flange spaces, and stationary lead-rails lengthened to the extent of shortening the point-rails and registering at their extremities with the heel ends of the point-rails, for the purpose set forth.

6. In a railway-switch formed of T-rails, the combination with the main rails, of point-rails each formed of a single piece having their outer flanges reduced in width at the heel portions, and set relative to the main rails to form therewith approximately the minimum permissible wheel-flange spaces, and lead-rails having their outer flanges reduced in width to lie against the inner main-rail flanges, and registering with and meeting at their extremities the heel ends of the point-rails, for the purpose set forth.

7. In a railway-switch formed of T-rails, the combination with the main rails, of point-rails having their outer flanges reduced in width at the heel portions, and set relative to the main rails to form therewith approximately the minimum permissible wheel-flange spaces, and lead-rails registering at their ends with and meeting the heel ends of the point-rails, and secured thereto and to the main rails, for the purpose set forth.

8. In a railway-switch formed of T-rails, the combination with the main rails, of point-rails having their outer flanges reduced in width at the heel portions, and set relative to the main rails to form therewith approximately the minimum permissible wheel-flange spaces, and lead-rails having their outer flanges beveled toward the ends of the rails to lie against the inner main-rail flanges, and registering with and meeting at their extremities the heel ends of the point-rails, and means connecting at their junction said point and lead rails together and with the main rails, for the purpose set forth.

9. In a railway-switch formed of T-rails, the combination with the main rails, of point-rails having their outer flanges reduced in width at the heel portions, and set relative to the main rails to form therewith approximately the minimum permissible wheel-flange spaces, lead-rails having their outer flanges beveled toward the ends of the rails to lie against the inner main-rail flanges, and registering and meeting at their extremities the heel ends of the point-rails, means connecting at their junction said point and lead rails together and with the main rails, and spacing-blocks interposed at intervals between the main and lead rails, for the purpose set forth.

10. In a railway-switch formed of T-rails, the combination with the main rails, of point-rails having their outer flanges reduced in width at the heel portions, and set relative to the main rails to form therewith approximately the minimum permissible wheel-flange spaces, lead-rails having their outer flanges beveled toward the ends of the rails to lie against the inner main-rail flanges, and registering with and meeting at their extremities the heel ends of the point-rails, a splice-bar crossing the joint between each point-rail and its lead-rail, a heel-block confined in each wheel-flange space, and bolts passing through the main rail, heel-block, point and lead rails and the splice-bar of each side of the switch, to unite them, for the purpose set forth.

11. In a railway-switch formed of T-rails, the combination with the main rails, of point-rails having their flanges reduced in width at the heel portions, and set relative to the main rails to form therewith approximately the minimum permissible wheel-flange spaces, lead-rails having their outer flanges beveled toward the ends of the rails to lie against the inner main-rail flanges, and registering with and meeting at their extremities the heel ends of the point-rails, a splice-bar crossing the joint between each point-rail and its lead-rail, a heel-block confined in each wheel-flange space, and bolts passing through the main rail, heel-block, point and lead rails and the splice-bar, of each side of the switch, to unite them, with a thimble in an opening in the point-rail neck about the foremost bolt and confined between said block and splice-bar, for the purpose set forth.

12. In a railway-switch formed of T-rails, the combination with the main rails and point-rails, of slide-plates permanently secured upon the bases of the main rails to extend across them and under the point-rails, and adapted to be spiked at their ends to the ties for se-

curing thereto the main rails on both sides thereof along the point-rails, substantially as described.

13. A rail-switch formed of T-rails, having the main rail, point-rail and lead-rail of each side of the switch joined together at the heel portion of the point-rail and there forming approximately the minimum permissible wheel-flange space, and slide-plates permanently secured upon the bases of the main rails to extend across them and under the point-rails and adapted to be spiked at their ends to the ties for securing thereto the main rails on both sides thereof along the point-rails, substantially as and for the purpose set forth.

14. A railway-switch formed of T-rails, having the main rail, point-rail and lead-rail of each side of the switch joined together at the heel portion of the point-rail and there forming approximately the minimum permissible wheel-flange space, and slide-plates riveted to the bases of the main rails through their flanges to extend across them and under the point-rails and provided with spike-holes in their ends through which to spike down upon the ties the main rails on both sides thereof along the point-rails, substantially as and for the purpose set forth.

AXEL A. STROM.

In presence of—
M. S. MACKENZIE,
J. H. LANDES.