

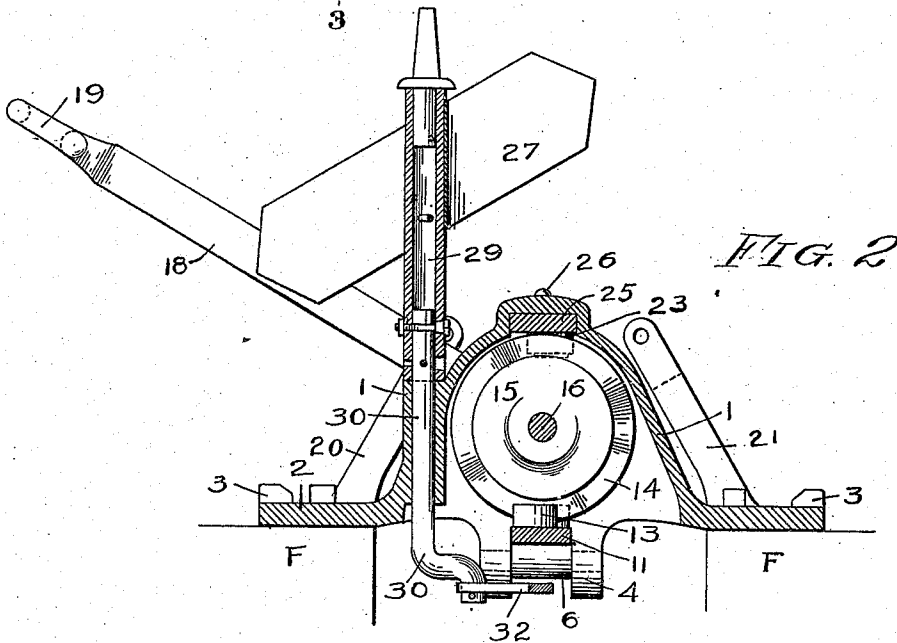
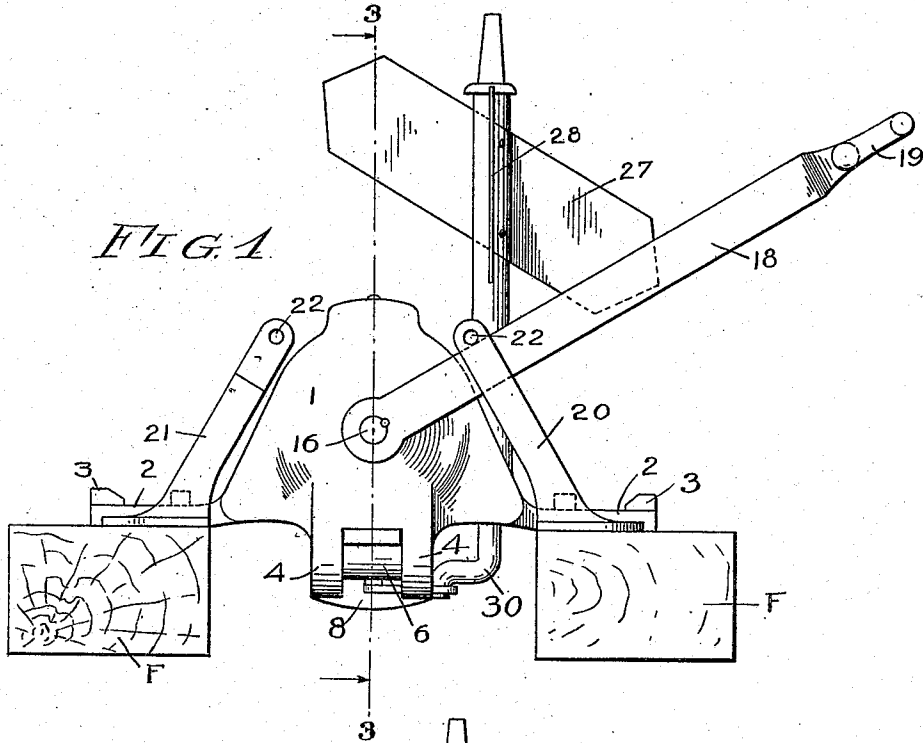
B. R. SCOTT.
SWITCH STAND.

APPLICATION FILED AUG. 28, 1908.

Patented Oct. 12, 1909.

3 SHEETS—SHEET 1.

936,819.



WITNESSES:

Brennan West.
Arthur S. Remberg.

INVENTOR,

Beverly R. Scott

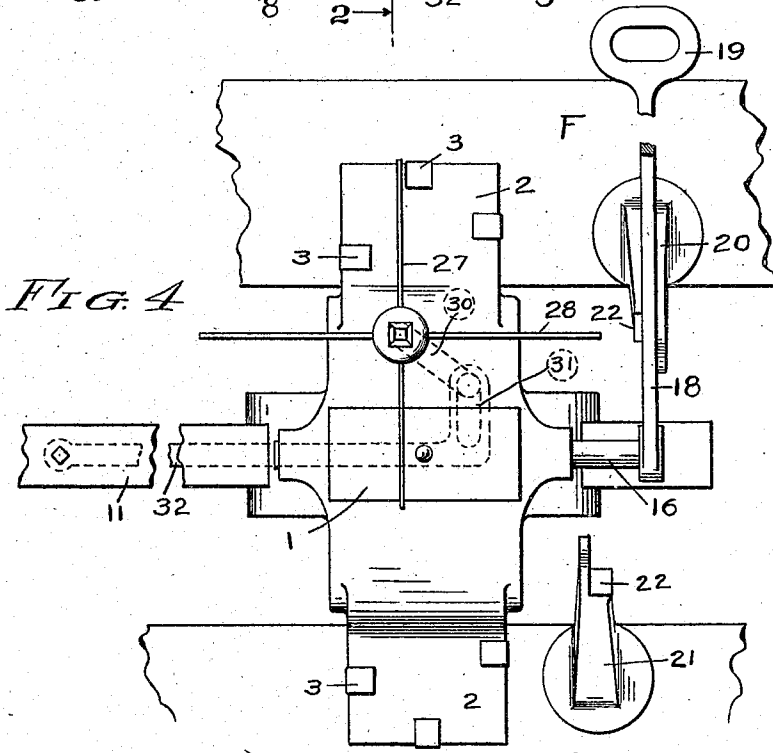
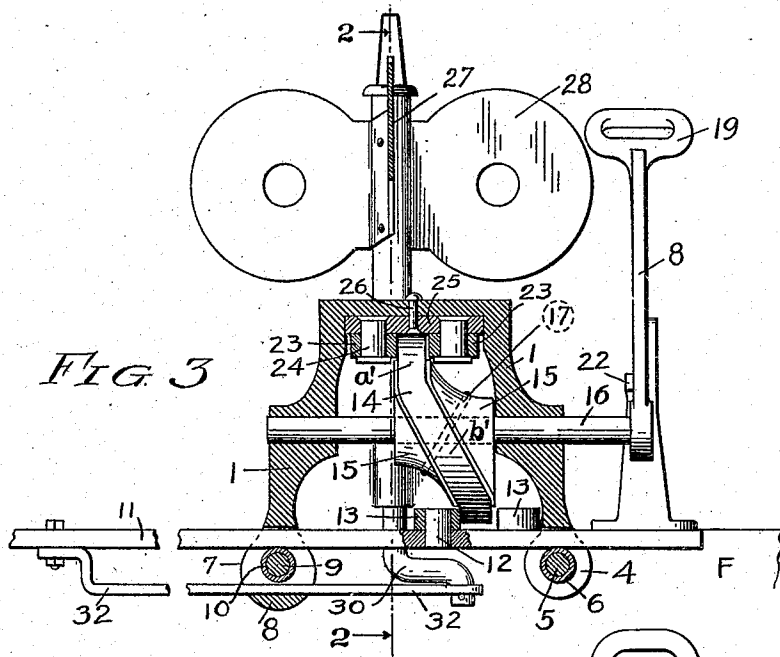
BY Balis, Fouts & Hull.

ATTYS.

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3 SHEETS—SHEET 2.



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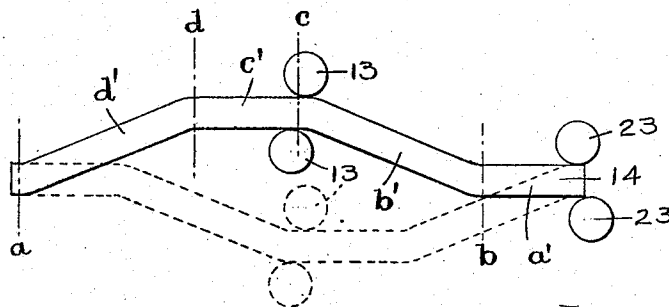
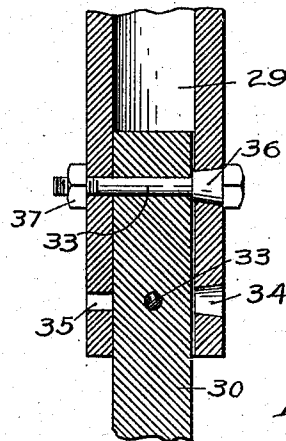
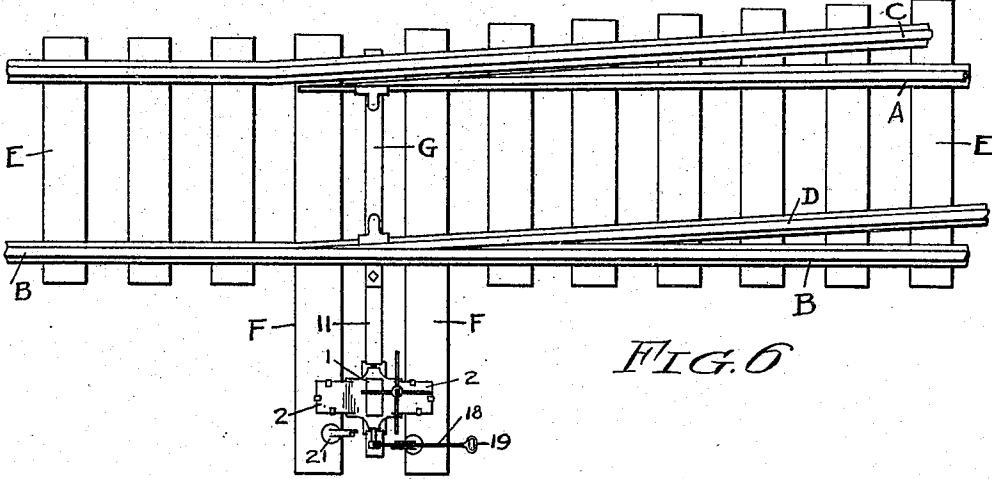
SWITCH STAND.

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3 SHEETS—SHEET 3.

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WITNESSES:

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UNITED STATES PATENT OFFICE.

BEVERLY R. SCOTT, OF CLEVELAND, OHIO.

SWITCH-STAND.

936,819.

Specification of Letters Patent.

Patented Oct. 12, 1909.

Application filed August 28, 1908. Serial No. 450,612.

To all whom it may concern:

Be it known that I, BEVERLY R. SCOTT, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Switch-Stands, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

This invention relates to switch stands, and it has for its object the production of a device of that character having the following advantages over switch stands heretofore used: First, owing to the nature of the frame or casing and the small number of parts employed in the mechanism, my switch stand has the advantage of economy of manufacture due to its lightness; second, the parts are so mounted in the casing and the latter is so constructed that the mechanism of the stand may be readily removed or replaced, thus making the stand simple in assembling; third; the main operating cam member is given a movement of translation as well as of oscillation, and is thus adapted to give the switch point rails a full throw with a comparatively slight movement of the said member, thus requiring a shorter range of action of the main operating lever; fourth, the shape of the operating cam is such as to provide a positive back lock against the shifting of the switch rails; or, by changing the normal positions of the main operating lever, the switch stand may be made automatic and capable of being thrown when a train runs through the switch; fifth, by the construction employed the banner is capable of being so changed on the banner mast as to render the switch stand capable of use for sidings going in either direction.

The above and other advantages will be more specifically pointed out in the following description of the drawings forming a part of this application, in which—

Figure 1 is an end view of the switch stand; Fig. 2 is a transverse sectional view taken on the line 2—2 of Fig. 3, and looking in the direction of the arrow thereon; Fig. 3 is a longitudinal sectional view taken on the line 3—3 of Fig. 1 and looking in the direction of the arrow; Fig. 4 is a plan view of the switch stand shown in Fig. 1; Fig. 5 is a sectional view through a portion of the banner mast; Fig. 6 is a plan view showing a railway switch and my switch stand for oper-

ating the same; and Fig. 7 is a diagrammatic view showing a development of the operating portion of the cam member.

The same reference characters refer to the same parts throughout the different views of the drawings, and, taking up a full description of the invention by reference to such characters, A and B represent the main rails of an ordinary railway track and C and D represent the rails forming the switch, A and D being the switch-point rails, the rails being laid upon the ties E in the ordinary manner.

F, F represent ties of greater length than the ties E, upon the extended ends of which my switch stand is mounted. The rails A and D are connected by a tie-rod or bar G, the switch stand operating mechanism being connected to said tie rod.

The operating mechanism of the switch stand is mounted in a casing 1, said casing being open on its lower side and having lateral projections 2 which rest upon the ties F, F, being held thereto by spikes 3, as is usual in such constructions. Projecting downwardly from the casing 1 between the ties F at one end of the casing are eye-pieces 4, the same being connected by a pin or bolt 5 having a sleeve or roller 6 journaled thereon, for a purpose hereinafter stated. Directly opposite the eye-pieces 4, at the other end of the casing are similar eye-pieces 7, the lower portions of which are connected by a bridge 8. These eye-pieces are also connected by a pin or bolt 9 having a sleeve or roller 10 similar to the roller 6 hereinbefore referred to. Resting upon the rollers 6 and 10, which are intended to avoid excessive friction, and guided between the eye-pieces 4 and 7 so as to move longitudinally, is a slide bar 11, said bar being connected with the tie-rod or bar G of the switch-point rails, whereby, when said bar is moved back and forth, the switch will be opened and closed as desired.

For sliding the bar 11, I secure thereto, in any desired manner, journal pins 12, one of said pins being shown in Fig. 3. Upon these pins I journal anti-friction rollers 13, there being sufficient space left between the rollers for the reception of the edge of a cam 14, having a hub 15 and being secured to a longitudinal shaft 16 that is journaled centrally in the ends of the casing 1. The cam may be secured to the shaft in any suitable manner,

as by a pin 17 extending through both the shaft and the hub, the pin being indicated in dotted lines in Fig. 3. The shaft and cam are oscillated in the operation of the switch stand by means of a hand lever 18, said lever preferably being provided at its free end with a hand grip 19. The two extreme positions of the hand lever are determined and fixed by stops 20 and 21 which are spiked or bolted to the ties F, F, against which stops the hand lever rests when in either of its extreme positions and against which it may be locked by inserting an ordinary padlock through an opening 22 in the upper ends of said stops, the stops being provided with shoulders 22 upon which the lever rests.

As shown in the drawings, the shaft 16 is capable of longitudinal movement in its bearings, and, as the hand lever 18 is swung, the said shaft will be given such longitudinal movement. This movement is produced by the cam 14, the operating edge of which projects between stationary rollers 23, which are journaled upon pins 24 that project from a plate 25, said plate being secured in the upper part of the casing in any suitable manner, as by a bolt or rivet 26. As shown in the drawings, the pins and rollers 13 and 23 are placed out of alinement with respect to the shaft 16 in order that the cam may not bind between the rollers. From this description it will be understood that, as the cam 14 is rotated, it, with its shaft 16, will be moved longitudinally back and forth within the casing.

In Fig. 7 I have shown in diagram a development of the operating portion of the cam and have also indicated the rollers 13 and 23. The diagram in full lines represents the relative position of these rollers with respect to the cam when the switch stand is in the position shown in Figs. 1 and 3. The dotted line position of the cam represents the position of these parts when the hand lever is thrown into its other extreme position. From this development it will be seen that the engaging portion of the cam is divided into four parts, the part between the dotted cross lines *a* and *b* being designated *a'*; the part between the dotted cross lines *b* and *c* being designated *b'*; the part between the dotted cross lines *c* and *d* being designated *c'*; and the remaining part between the dotted cross lines *d* and *a* being designated *d'*. As will be seen, the parts *a'* and *c'* lie in planes which are perpendicular to the axis or shaft 16. In other words, they have no pitch. The parts *b'* and *d'* lie in planes which are inclined to the axis or shaft 16, and therefore have a pitch. Preferably the parts *a'* and *c'* each occupy approximately one-sixth of the circumference of the cam, while the parts *b'* and *d'* each occupy approximately one-third of said circumference. Referring now to Fig. 3, it will be under-

stood that if the rollers 23 were omitted and the cam had no movement of translation, the slide bar 11 would be moved, upon one complete swing of the hand lever 18, a distance equal to the vertical projection of the inclined part *b'* of the cam upon the said bar. That is to say, the movement of the hand lever would bring the part *a'* shown in Fig. 3, into engagement with the rollers 13, so that the bar 11 would be moved longitudinally until the space between the said rollers would be directly beneath the part *a'*, as shown in Fig. 3. This movement, however, is only half of the desired throw of the slide bar; and the additional throw of said bar is secured by causing the cam to operate between the stationary rollers 23, the part *d'* of the cam operating against said rollers 23 simultaneously with the operation of the part *b'* against the rollers 13. The movement of translation of the cam is therefore multiplied two-fold, and the desired throw of the bar is secured.

As shown in Fig. 7, when the lever 18 is in its extreme positions, both sets of rollers 13 and 23 engage with the straight portions of the cam. This provides an absolute back lock against the automatic opening of the switch; for, the switch cannot open without moving the slide 11, and as the rollers 13 thereon engage with surfaces perpendicular to the line of their motion they cannot turn the cam. When the switch stand is new and unworn, these rollers preferably rest against the said straight portions of the cam near the ends thereof. Owing to the continued use of the stand, the cam is liable to become somewhat worn, so that these portions against which the rollers have been bearing become worn away and inclined, thus weakening the locking action of the stand. When such a result occurs, the stops 20 and 21 may be moved farther apart, so as to permit the operating lever 18 to swing through a somewhat greater arc, thereby bringing a fresh portion of the cam opposite the rollers. These stops 20 and 21 may also be so proportioned in length as to shorten the arc through which the main lever swings and thus stop the cam with the rollers 13 and 23 at the ends of but resting against the inclined portions of the cam. When thus constructed, the switch is rendered automatic in its operation, and a train running through the switch would automatically throw the operating lever and thus permit the train to pass without breaking the stand or any of its connections.

Combined with the mechanism thus described, and forming part of my switch stand, is a signal or banner indicating the condition of the track. The banner consists preferably of two pairs of blades or vanes 27 and 28, indicating a clear track and a thrown switch respectively. These blades or

vanes are secured to a tubular sleeve or member 29 which fits over the upper end of a crank shaft 30, said shaft being journaled in the casing 1. The crank end of the shaft is 5 below the casing, and it operates in a slot 31 that is formed in the end of a bar 32, said bar having its opposite end bolted or otherwise secured to the slide bar 11, the bar 32 resting upon the bridge or yoke 8 hereinbefore described. In this manner the longitudinal 10 movement of the bar 11 swings the crank shaft 30 through an arc substantially equal to 90 degrees, thereby presenting the flat faces of the blades 27 and 28 to the 15 view of the engineer. In Figs. 2 and 5 I have shown my preferred connection between the shaft 30 and the tubular sleeve 29.

It sometimes becomes desirable to change the switch stand and its connections so as to 20 necessitate the changing of the blades 27 and 28. That is to say, if the blades have been so positioned on the mast as to indicate an open track with the lever 18 swung into one position, and the stand or the switch is changed 25 so as to reverse the position of this lever for an open track, it becomes necessary to reverse the banner. I have therefore adopted the construction referred to and have secured the tubular part of the mast to the 30 crank shaft by telescoping the one over the other and bolting the two together by means of the bolts 33. On one side of the sleeve 29 I form apertures 34 of tapering or conical shape, and directly opposite said apertures I 35 form bolt holes 35 of a size to accommodate the stem of the bolt. The bolt 33 is formed with a tapered head 36 which fits within the opening 34 and bears against the side of the crank 30. The nut 37 is screwed against 40 the outer side of the tubular part of the mast, thus drawing the head 36 against the crank 30 and pressing the tube 29 against the opposite side of the crank, thereby tightly clamping the two parts of the mast together. 45

The open bottom of the casing not only makes the switch stand light in weight, but makes it convenient in the assembling of the parts. Thus, the cam member may be placed 50 in the casing and the shaft 16 extended through the casing and member and the pin 17 driven into position without removing any part of the casing. Similarly, the slide bar 11 and the bar 32 may be slipped into 55 position, after which the pins 5 and 9 with their rollers may be inserted. The stand is dismantled for repairs with equal facility.

Various changes in the details of the construction illustrated and described may be 60 resorted to without departing from the spirit of my invention. As one example of such construction, I may mention the equivalent construction of having the engaging portion of the cam made a raceway which is de- 65 pressed in the cam, into which raceway

single rollers 23 and 13 may respectively extend. The shaft 16 may also be held against longitudinal movement, and the cam so mounted thereon as to turn with the shaft but to slide freely thereon. I do not intend, 70 therefore, that the following claims be limited to the details of construction shown any further than is rendered necessary by the specific terms employed therein.

I claim:

1. The combination with the railway 75 switch-point rails, of a switch stand, said stand having a frame, operating mechanism for said rails supported by said frame, said mechanism including a movable member, 80 means stationarily mounted in one part of the frame and engaging with said member at one part thereof for preventing at that part movement of said member in one direc- 85 tion, a second member connected with the said rails and engaging with another part of the first member, and means for moving the first member, said means being connect- 90 ed therewith at a point intermediate the said parts thereof, whereby the movement imparted to the said first member at the said point of connection is multiplied at the point of engagement with the second member, for the purpose specified.

2. The combination with the railway 95 switch-point rails, of a switch stand, said stand having a frame, operating mechanism for said rails supported by said frame, said mechanism including a movable member, 100 means stationarily mounted in one part of the frame and engaging with said member at one part thereof for preventing at that part movement of said member in one direc- 105 tion, a second member connected with the said rails and engaging with another part of the first member, a hand lever, and means 110 connected with the hand lever for moving the first member, said means being connected with the member at a point intermediate the said parts thereof, whereby the move- 115 ment imparted to the said first member at the said point of connection is multiplied at the point of engagement with the second member, for the purpose specified.

3. The combination with the railway 115 switch-point rails, of a switch stand, said stand having a casing, an oscillating member in said casing, means for oscillating the member, stationary means in the casing for causing said member to move in the direc- 120 tion of its axis of oscillation when the member is oscillated in either direction, connections between said member and said rails for moving the latter as the member is moved, a banner-post, and means for turn- 125 ing the banner-post simultaneously with the movement of the rails.

4. The combination with the railway switch-point rails, of a switch stand, said stand having a frame, an oscillating cam in 130

said frame, means for oscillating the cam, a member connected with the rails and engaging with the cam, and means for causing the cam to move longitudinally as the same is rotated, thereby imparting a longitudinal motion to said member and moving the rails.

5. The combination with the railway switch-point rails, of a switch stand, said stand having a frame, an oscillating cam in said frame, means for oscillating the cam, a member connected with the rails and engaging with the cam, means for causing the cam to move longitudinally as the same is rotated, thereby imparting a longitudinal motion to said member and moving the rails, a banner-post, and means for turning the banner-post simultaneously with the movement of the rails.

6. The combination with the railway switch-point rails, of a switch stand having a casing, an oscillating shaft journaled in said casing, a hand lever connected with the shaft for oscillating the same, a cam on said shaft and oscillating therewith, said cam having on its opposite sides portions inclined with respect to the shaft, stationary means engaging with the cam, a slide bar engaging the cam and connected with the said rails, the slide bar and the stationary means simultaneously engaging the inclined portions of the cam whereby, as the cam is oscillated, one of said inclined portions engaging the stationary means will impart to the cam a movement of translation, and the other inclined portion of the cam engaging with the slide bar will move the latter a distance greater than the movement of translation given to the cam.

7. The combination with the railway switch-point rails, of a switch stand having a casing, an oscillating shaft journaled in said casing and capable of longitudinal motion in its bearings, a hand lever connected with the shaft for oscillating the same, a cam on said shaft and oscillating therewith, said cam having on its opposite sides portions inclined with respect to the shaft, stationary means engaging with the cam, a slide bar engaging the cam and connected with the said rails, the slide bar and the stationary means simultaneously engaging the inclined portions of the cam whereby, as the cam is oscillated, one of said inclined portions engaging the stationary means will impart to the cam and the shaft a movement of translation, and the other inclined portion of the cam engaging with the slide bar will move the latter a distance greater than the movement of translation given to the cam and shaft.

8. The combination with the railway switch-point rails, of a switch stand having a casing, a shaft journaled in the casing, a cam mounted to turn with said shaft, means for turning the shaft, the operating part

of the cam having two inclined portions, a stationary projection in one part of the casing engaging the cam, a slide bar in another part of the casing engaging the cam, and connections between the slide bar and the switch point rails, the construction being such that, when the cam is turned the engagement of the stationary projection with one inclined portion of the cam shifts the latter in the direction of its shaft, and the other inclined portion of the cam engaging with the slide bar causes the latter to move a distance greater than the distance through which the cam is moved.

9. The combination with the railway switch-point rails, of a switch stand having a casing, a shaft journaled in the casing, a cam mounted to turn with said shaft, means for turning the shaft, the operating part of the cam having two inclined portions, a stationary projection in one part of the casing engaging the cam, a slide bar in another part of the casing engaging the cam, connections between the slide bar and the switch point rails, the construction being such that, when the cam is turned the engagement of the stationary projection with one inclined portion of the cam shifts the latter in the direction of its shaft, and the other inclined portion of the cam engaging with the slide bar causes the latter to move a distance greater than the distance through which the cam is moved, a banner-post, and means for turning the banner-post simultaneously with the movement of the rails.

10. The combination with the railway switch-point rails, of a switch stand having a casing, an oscillating shaft journaled in said casing and capable of longitudinal movement in its bearings, a member secured to said shaft and having a peripheral cam, said cam having two inclined portions, an anti-friction roller journaled in stationary bearings in one part of the casing, a slide bar in that part of the casing that is opposite the shaft from the said anti-friction roller, means on the said bar for engaging with the cam on the said member, and connections between the bar and the switch point rails, the construction being such that, when the said member is turned the cam thereon engaging with the anti-friction roller will shift the member in the direction of the shaft, and the cam, also engaging with the slide bar, will move the latter a distance equal to twice the movement of the member.

11. The combination with the railway switch-point rails, of a switch stand having a casing, an oscillating shaft journaled in said casing and capable of longitudinal movement in its bearings, a member secured to said shaft and having a peripheral cam, said cam having two inclined portions, an anti-friction roller journaled in stationary bearings in one part of the casing, a slide

bar in that part of the casing that is opposite the shaft from the said anti-friction roller, means on the said bar for engaging with the cam on the said member, connections between the bar and the switch point rails, the construction being such that, when the said member is turned the cam thereon engaging with the anti-friction roller will shift the member in the direction of the shaft, and the cam, also engaging with the slide bar, will move the latter a distance equal to twice the movement of the member, a banner-post, and means for turning the banner-post simultaneously with the movement of the rails.

12. The combination with the railway switch-point rails, of a switch stand having a casing, a shaft journaled in said casing and adapted to have longitudinal movement in its bearings, a member secured to the shaft and moving therewith, a cam projecting from the periphery of said member, a pair of anti-friction rollers secured in the upper part of the casing on opposite sides of the cam, a slide bar mounted for longitudinal movement in the lower part of the casing, a pair of anti-friction rollers on the slide bar extending on opposite sides of the cam, connections between the slide bar and the switch point rails, and means for turning the shaft.

13. The combination with the railway switch-point rails, of a switch stand having a casing, a shaft journaled in said casing and adapted to have longitudinal movement in its bearings, a member secured to the shaft and moving therewith, a cam projecting from the periphery of said member, a pair of anti-friction rollers secured in the upper part of the casing on opposite sides of the cam, a slide bar mounted for longitudinal movement in the lower part of the casing, a pair of anti-friction rollers on the slide bar extending on opposite sides of the cam, connections between the slide bar and the switch point rails, means for turning the shaft, a banner-post, and means for turning the banner-post simultaneously with the movement of the rails.

14. The combination with the railway switch-point rails, of a switch stand having a casing, a shaft journaled in said casing, a member on the shaft and turning therewith, said member having a cam on the periphery thereof, said cam having two diametrically opposite portions which are in planes perpendicular to the shaft and two diametrically opposite portions which are in a plane inclined to the shaft, an anti-friction roller stationarily journaled in the upper part of the casing and engaging with the cam, a slide bar in the lower part of the casing engaging with the cam, a hand lever secured to the shaft for oscillating the latter, and connections between the slide bar and

the switch point rails, the construction being such that, when the hand lever is in its extreme positions the said roller and the slide bar will engage with those portions of the cam that are in planes perpendicular to the shaft, and in moving from one position to the other the inclined portions of the cam will shift the cam longitudinally and will carry the slide bar twice the distance said cam is shifted.

15. The combination with the railway switch-point rails, of a switch stand having a casing, a shaft journaled in said casing and having longitudinal movement therein, a member secured to the shaft, said member having a cam projecting from the periphery thereof, said cam having two diametrically opposite portions which are in planes perpendicular to the shaft and two diametrically opposite portions which are in a plane inclined to the shaft, a pair of anti-friction rollers stationarily journaled in the upper part of the casing and engaging with the opposite sides of the projecting cam, a slide bar in the lower part of the casing, a pair of anti-friction rollers mounted on said slide bar and engaging with the opposite sides of the projecting cam, a hand lever secured to the shaft for oscillating the latter, and connections between the slide bar and the switch point rails, the construction being such that, when the hand lever is in its extreme positions the said pairs of rollers will engage with those portions of the cam that are in planes perpendicular to the shaft, and in moving from one position to the other the inclined portions of the cam will shift the cam longitudinally and will carry the slide bar twice the distance said cam is shifted.

16. The combination with the railway switch-point rails, of a switch stand, means connecting the said rails with the stand for operating the rails when the stand is operated, a banner post for the switch stand, said post comprising a crank member and a tubular member extending over the end of the crank member, the said members having registering holes for the reception of a connecting bolt, a bolt extending through said registering openings, the head of the bolt extending through one side of the tubular member and resting against the crank member and the nut of the bolt engaging with the outer opposite side of the tubular member whereby the tubular member is securely clamped to the crank member.

17. The combination with the railway switch-point rails, of a switch stand, a slide bar in said stand, means for sliding said bar, connections between the bar and the rails for moving the latter when the bar is moved, a banner post, said post comprising a crank member and a tubular member, the crank member extending into the tubular member, banners connected with the tubular mem-

ber, a slotted plate connecting the crank member with the slide bar, a bolt extending through the crank and the tubular member, the head of the bolt extending through an opening in one side of the tubular member and resting against the crank member and the nut of the bolt resting against the outer part of the tubular member on its opposite side whereby, when the nut is tightened the

tubular member and the crank member are 10 securely clamped together.

In testimony whereof, I hereunto affix my signature in the presence of two witnesses.

BEVERLY R. SCOTT.

Witnesses:

S. E. FOUTS,

BRENNAN B. WEST.