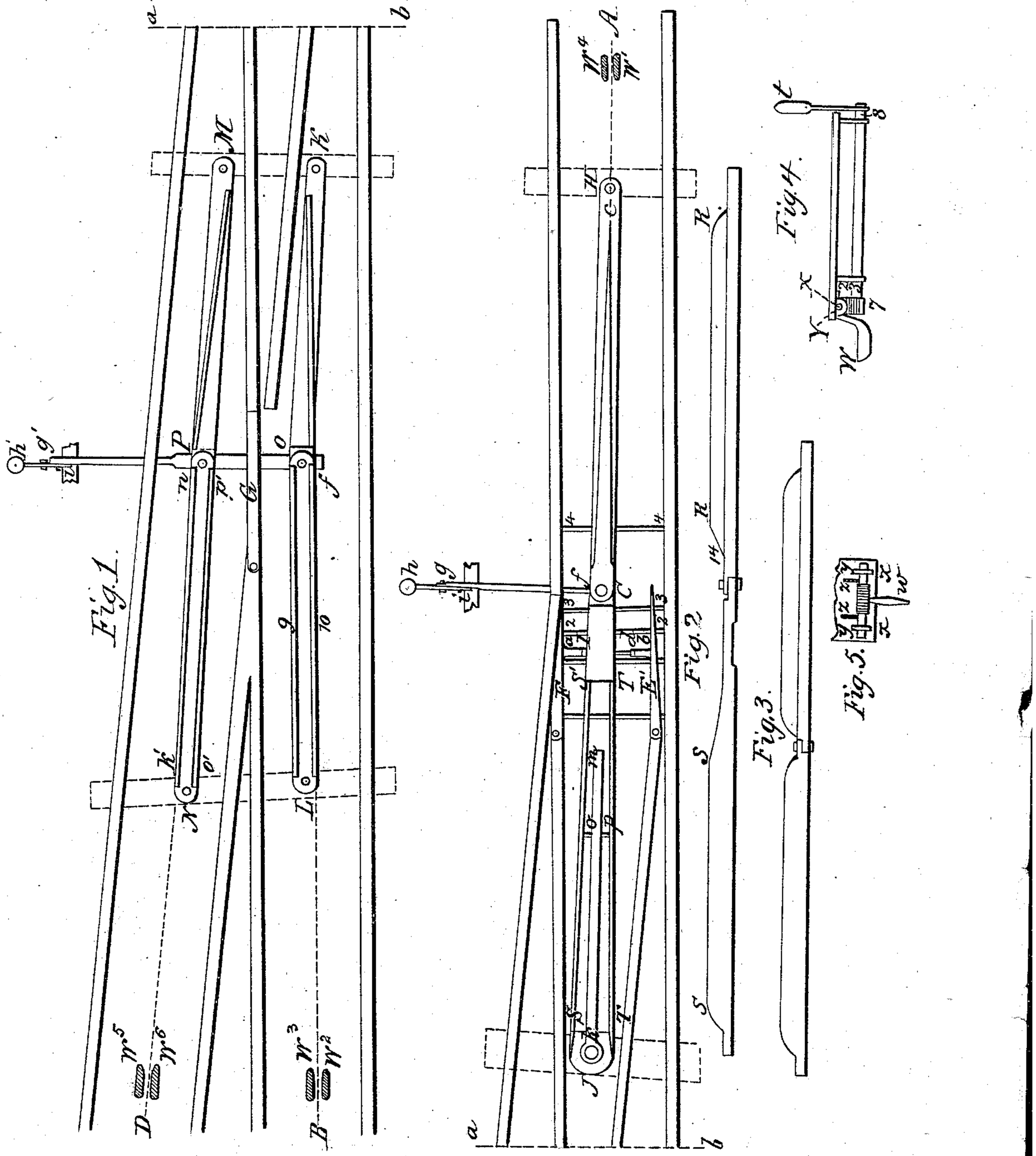
J. F. KLEIN.

Railroad Switch.

No. 8,906. Patented April 27, 1852.



UNITED STATES PATENT OFFICE.

JOHN F. KLEIN, OF TRENTON, NEW JERSEY.

RAILROAD-SWITCH.

Specification of Letters Patent No. 8,906, dated April 27, 1852.

To all whom it may concern:

Be it known that I, JOHN F. KLEIN, of the city of Trenton, county of Mercer, and State of New Jersey, have invented a new and useful Improvement for Railroad-Switches and the Mode of Operating Them; and I do hereby declare that the following is a full, exact, and clear description of the construction and operation of the same, reference being had to the accompanying drawings and the letters of reference marked thereon.

Figure 1 represents the plan of a railroad, in which one track as A, B, is supposed to be straight, and the other track C, D connected thereto; to be a turn out, or sideling, or any similar case where the application of a switch would be required. E and F are the movable bars, or rails, of the switch, and G, the movable bar, or rail, of the frog. These bars are usually, I believe, at the present time, moved back and forth as may be required, by the direct action of a lever placed at the side of the road, and operated upon by some agent of the company placed there for the purpose. Contrivances have been proposed, and some of them patented, for shifting and adjusting these movable bars of railroad switches by an impulse, or blow, from the train or cars as they pass to and fro along the road, but from the evidently complicated character of some of these contrivances, or the imperfect and partial operation of others, few, if any, have as yet been adopted on public works. In the contrivance patented by Mr. Richard W. Sheckeles in 1840, and also in another, for the same purpose, by Mr. John C. Post of a more recent date, the appendages for receiving the impulse from the cars and thereby moving the switch, are placed on the outside of the track. These two contrivances are very similar in construction and mode of operation—the levers in one case operating vertically, whereas in the other they are made to move in a horizontal direction. In both of these inventions there are used not less than four levers, two on each side of the switch, and if we suppose either of them to be applied to the single switch, or frog, which is necessarily appurtenant thereto; the number of levers and other working parts would be more than doubled. The switch adjuster patented by Mr. Jesse La Rue of Berks county, Pennsylvania, is evidently more simple in construction than either of the preceding, but as the patentee in his specifications very justly remarks, the contrivance "contemplates the train keeping on the right hand track" or in other words it is only applicable to passing the train in one direction. There is also in this contrivance another objection, which appears to be of considerable importance, in all contrivances of this character so as to insure durability of action. I mean the suddenness, or rapidity, with which the switch must be moved. From the manner in which the levers are arranged, the impulse from the cars, and its effect on the switch will be accomplished while the cars move scarcely one foot along the track. This must be obvious from the construction proposed—the fulcrum of the levers being in the middle, and the impulse from the train being imparted to them almost instantaneously, its effect on the switch must be similar. The numerous accidents which have occurred, and are still occurring almost every day, at switches left in charge of individuals on the road as we have already mentioned, are mainly traced to carelessness or inattention. In most of the contrivances which have been devised to supersede these agents, and to place the matter under the control of the engineer of the locomotive, or some other agent on the train; no provision has been made for the probabilities of carelessness or negligence in this quarter. In order therefore to obviate the difficulties and objections to the contrivances above referred to, I propose to arrange and construct my switch adjuster in the following manner: I connect the movable bars, or rails, of the switch together by means of the coupling rods *a*, *b*, with free bolts, as in the usual manner, so as to allow the bars to work freely on the bolts. The space below the switch and the parts used for its adjustment may be left void, or hollow, to receive the dust, dirt, snow or the like that might obstruct the sliding motion required. 1, 1, 2, 2, 3, 3 and 4, 4 represent wood, or iron bars, laid across the track whereon the switch and adjusting bars slide back and forth. It will be understood that when the coupling rod *a*, *b* is moved toward one side of the track, or the other, it carries the bars, or rails, of the switch with it, and consequently will open or close either track as the case may be. To produce this motion, at the will of the engineer, or any other

suitable agent on the train as it approaches the switch, I propose to have in front of the locomotive, or cow-catcher, a projection in form of a wedge, pin roller or the like, connected in such manner that it may be moved either on the right or left hand side of the middle of the track at the option of the person moving it. H, C and C, J are the adjusting bars or shifters.

In Fig. 2 is given a side view of these two cars—the single shifter H, C has only one wedge formed flange raised upon it as R, R. The double shifter C, J, has two flanges S S and T, T. At H and J these shifters are fastened with a free bolt to the middle of the track on a cross tie or the like. The other ends at C are joined together with a free bolt, which also connects it with the rod *f*, *g* and the ball and lever *h i*. The double shifter lies over the coupling rod *a b* and between the stops I, *d* which are fastened thereon. Between the two flanges of the double shifter is placed a movable bar or tongue *k*, *m*, movable on the bolt at *k*, and sliding on the cross bar *o*, *p*. In the above construction of the adjuster it is designed to open or close the switch from either branch of the track. When it is only required to move a single switch bar, at the frog for instance, as at G, Fig. 1, a single and double shifter must be laid in the middle of each track as M, P, N, and K, O, L; the tongue of the double shifter may be dispensed with, and the flanges on the single shifters made with sides parallel instead of wedge formed.

Fig. 3 is a side view of the shifters for a single switch bar. The form of single shifter here described would answer in cases where it was required to pass the cars in one direction only. It will also be obvious that the double shifters here mentioned would be applicable to all such cases where the two tracks deflected from each other at a very small angle.

In Figs. 4 and 5 are shown the form of a projection to be applied to some part of the locomotive and the manner in which the same may be readily moved at the will of the engineer as may be required. W, in both figures represents the projecting wedge (or rudder, as we shall hereafter call it). This rudder is connected with a small shaft X X, whereon it has a small circular motion, and is held in its bearings Y, Y, so as to slide therein. On the shaft is fastened a small rack, this rack is meshed on to the segment of a small cog wheel 7, fastened on the end of a shaft 8 8, to which is attached the lever and handle *t*. It will be understood that as this lever is pushed to one side or the other of the car, it will form the connection above mentioned move the rudder accordingly.

In Fig. 1 the switch bars E, F, are shown as open for the straight track A, B; and the edge C, *c* of the flange of the single shifter; T, T of the double shifter; as also those of K O and O L, are all parallel with the direction of this track. Consequently if we suppose the cars to be running from A to B, and the rudder to be placed on the left hand side of the middle of the track as at W^1, it would pass clear of all the flanges, or in other words the train would pass along the track without any change in its direction. The same would be the case if the train was running from B to A, this would be obvious when the rudder is as shown at W^2. But suppose it to be as shown at W^3, in this case it would pass between the double flanges 9, 10 of L O, and between the flange T, T and the tongue *k m*, and after leaving the double flange, from the construction of the rudder as explained in Fig. 4 it would ride over the flange of the single shifter C, H. This follows from the circular motion which may be given to the rudder and the inclination which is given to the end of the single flange as shown at R, 14, in Fig. 2. The rudder it will be seen may rise upward to a certain height but cannot descend below its proper position in consequence of the stops *z*, *z*, attached to it as shown in Figs. 4 and 5.

Let us now suppose that the train is to move from A to D, the switch being as before mentioned. In this case the rudder would be placed on the right hand side of the track as shown at W^4, and as the train advanced would come in contact with, and press against the side of the flange *f*, *c* thereby pushing it over toward the other side of the track. But as the single shifter C, H, is connected with the double shifter C, J, lying on the coupling rod *a b*, between the stops I, *d;* the double shifter would be brought up to the stop *d*, and thus the motion communicated to the switch bars E, F, to move them to the other side of the track. In order to prevent reaction, or rebounding in the switch, the shifters are connected by the rod *f*, *g*, with the lever and ball *h i*, placed on one side of the track. As the train advances it comes or brings the rudder in contact with the flange of the shifter M P, which is urged as before to the opposite side of the track and along with it the coupling rod O, P to which is bolted with free bolts, the single switch G, and the other two shifters in the adjoining track K, L. To this coupling rod is also attached the rod P, *g′* and lever and ball *h′ i′*. If now we suppose the train to be running from D to A, the adjuster being as shown in the drawing Fig. 1, let the rudder be on the left hand side of the track as shown at W^5, in this case it would come in contact with the flange *k′ n*, of the double shifter N, P, and would press the shifter, and its connections, over to the opposite side, and as it advanced

would come in contact with the flange S, S; of the double shifter C, J and move it in a similar manner in both instances placing the bars of the switch in a proper position for the train to move along unimpeded.

If we suppose the rudder to be on the right hand side of the track, as at W⁶, it will then as it advances along the road pass in between the two flanges *k' n*, and *o' p'* of the double shifter and come into contact with the flange *o' p'* will press against it and urge it over as in the former case. So also when it approaches the double shifter C, J, it will pass in between the tongue *k*, *m*, and the flange S, S, and pressing against the tongue will move it over against the flange T, T, and as the rudder is carried forward, will urge the adjuster with the switch bars thereto connected to the opposite side of the track.

It will be understood that the flanges are in height elevated so as to raise a few inches above the top of the rails of the road. In passing from the single, to either one of the double tracks, it will be seen that whether the rudder be on the right, or on the left, the train could not possibly run off the track. So also in passing from either one of the double tracks to the single track, however the rudder may be placed, or in whatever position the switches may be, the rudder would operate on the adjuster to place the switches in their proper position so as to pass the train without interruption.

I propose to make my shifters either of wood or metal, when constructed of wood the flanges which are elevated above the level of the track, and against which the rudder operates should be faced with wrought iron. I prefer however to make them of cast or wrought iron.

It will be seen that my adjuster is applicable to any of the ordinary kind of switches as now used on rail roads.

If the flange 9 upon L O was removed and the train moved from B toward A with the rudder at W³ and the switch G was not in a proper position for the train to proceed the rudder would not move it; or if the tongue *k m* in J C was removed and the switches E F were not in the right place the rudder would not move them; or if the flange *o' p'* was removed and the train moved from D toward A with the rudder in the position W⁶ and the switch G was not in a proper position for the train to pass the rudder would not move it; or if the tongue *k m* was removed and the switches E F were not in a proper position the rudder would not move them; hence the necessity of making two flanges upon L O and N P and the tongue *k m* or its equivalent in J C as described so that in whichever position the rudder may be and in whichever direction the train may run, if the switch or switches are not in a proper position, the rudder will act upon the shifters and move them to the proper place so that the train may pass unimpeded and without the risk of running off the track.

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

The bars or shifters J C H, L O K and N P M constructed, arranged and connected to the switches of a rail road in the manner and for the purpose substantially as described so that if the train run in either direction and the rudder be placed in either position as described and if the switch or switches are not in a proper position, the rudder will act upon the shifters and move them gradually as the train approaches so as to move and place the switches in such a position that the train may pass on unimpeded without the risk of running off the track.

In testimony whereof, I have hereunto signed my name before two subscribing witnesses.

JOHN F. KLEIN.

Witnesses:
JOS. RICHARDS,
SAM A. EVANS.