J. W. HOFFMAN.

Switch Signal.

No. 6,548.

Patented June 19, 1849.

Fig. 1

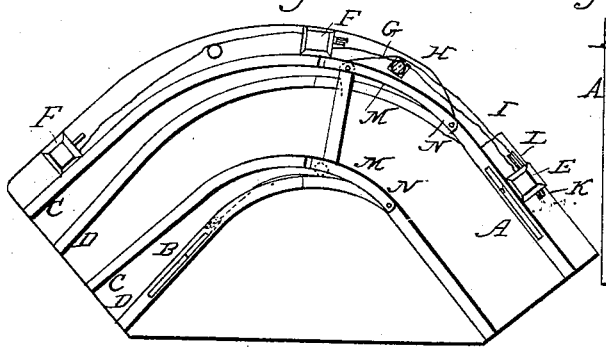


Fig. 12 Fig. 11 Fig. 10 Fig. 9

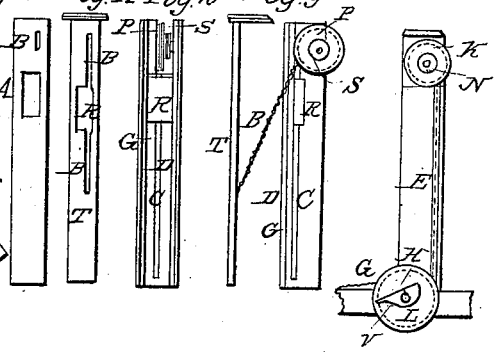


Fig. 4

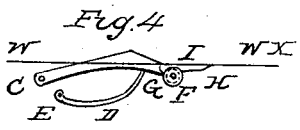


Fig. 5

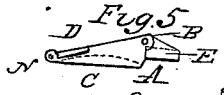


Fig. 6

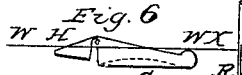


Fig. 7

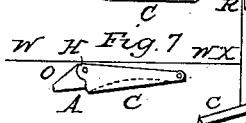


Fig. 8

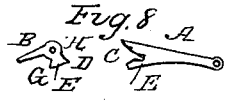


Fig. 2

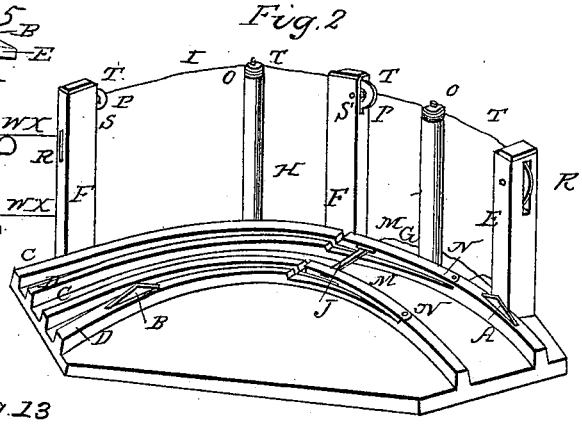


Fig. 3

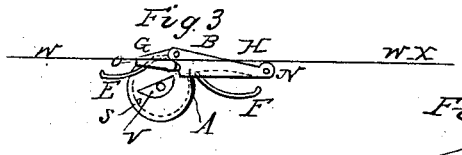


Fig. 13

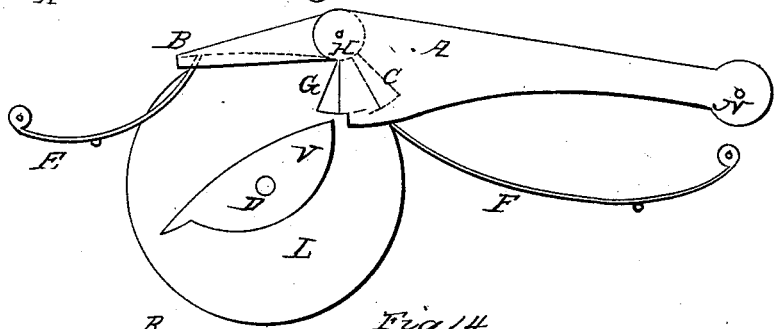
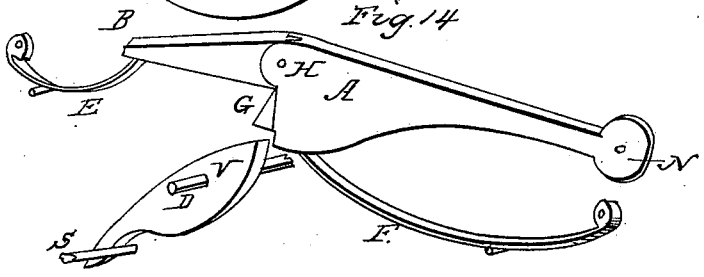


Fig. 14



UNITED STATES PATENT OFFICE.

J. W. HOFFMAN, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO L. B. KELLEY AND B. HARPER.

LEVER TO BE PLACED ON A RAILROAD-TRACK AND ACTED UPON BY THE WHEELS OF CARS OR LOCOMOTIVES.

Specification of Letters Patent No. 6,548, dated June 19, 1849.

To all whom it may concern:

Be it known that I, JOHN W. HOFFMAN, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and useful machine for the purpose of preventing the collision of cars and for the regulation of switches and turnouts on railroads, known as the "Self-acting lever to prevent the collision of cars and for the regulation of switches and turnouts on railroads," and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1, is a ground view. Fig. 2, is a perspective view, and Figs. 3, 4, 5, 6, 7, 8, 9, 10, 11 and 12, are sectional views; Fig. 13, is an elevation of joint lever, on large scale; Fig. 14, is a perspective view, of joint lever, on large scale.

Fig. 1, C, C, and D, D, are rails on railroad. A, and B, are levers in rails. E, F, F, and H, H, are posts, erected on the outside of rail, G and I, are chains, L and K, are wheels. M, M, are moving rails in turnout. N, N are bolts. J is a coupling bar.

Fig. 2, C, C, and D, D, are rails on railroad. A and B, are levers in rails. E, is lever post. F, F, are signal posts. G, is a chain regulating turnout. H, H, are friction posts. I is a chain and rod for raising signal. J is a bar, coupling movable rails M, M, together. K, is a wheel on which chain winds in raising signal. M, M, are shifting rails moving from track C, C, to track D, D; so as to let cars pass, from track, C, C, over to track D, D. N, N are bolts securing the one end of shifting rails M, M to rails, D, D. *o*, *o*, are friction wheels, supporting rod I. P, P, are wheels on each of which a chain winds in raising signal. R is a space to set a lamp in at night. *s*, *s* are wheels around which a chain goes, turning them in raising signal. T, T, T, T are points at which the chain is fastened to the rod.

Fig. 3 is an elevation of joint lever A; Figs. 1 and 2, the line W, WX, being the top of rail, as shown by C, C, and D, D. Figs. 1 and 2, E, and F, are springs, forcing the lever up when not acted upon by car wheels, as shown by A, Figs. 1 and 2. N, is a bolt securing heel of lever A, in rail C. V is cam or arm on the axle of wheel L, by which L is turned from the action of the lever on V. L, is a wheel around which a chain winds, when the lever acts on V. The dotted lines *c*, and *o*, shows projection of the covering of lever, in which springs E, and F, fit; keeping the point of the springs in their proper place and preserving them from the effects of ice.

Fig. 4, is an elevation of lever B, in rail D, Figs. 1 and 2. D, is a spring by which B, is forced up in the rail when not acted upon by car wheels. *c* is a bolt securing heel of B in rail D, Figs. 1 and 2. E is a bolt securing spring in rail. F, is a wheel in rail D, at the point of lever B, Figs. 1 and 2, over which a chain moves in changing movable rails M, M, Figs. 1 and 2, from rails C, C, to rails D, D, Figs. 1 and 2, so as to let cars pass from C, C, to D, D, Figs. 1 and 2. In the construction of joint lever A, Figs. 1 and 2, Fig. 8, is a sectional view of the inner workings of the lever, without its coverings. *c*, in section A, Fig. 8, is an open space into which point D, section B fits and moves. E, in Sec. A, is a projection against which point F, in Sec. B, rests, when forced up by spring E, Fig. 3. H, Sec. B, is a hole for a bolt in putting the coverings on and securing, sections A and B, together.

Fig. 7, is the covering of sections A and B, Fig. 8. The dotted line *c*, being the inner part of lever as shown, by *c*, *c*, *c*, Figs. 3, 5, and 6.

Fig. 5 is a side view of joint lever A, Figs. 1 and 2. D, is bevel on the side of lever, affording space for dirt to pass out that might get in when cars force lever down. The dotted line E, shows projection of covering over inner part of lever as shown, by Sec. B, Fig. 8.

Fig. 9, E, is the lever post; L, is a wheel to which chain A, is fastened, going up post E to wheel N around N, and fastened to wheel N. V, is the cam on which joint lever A, Figs. 1 and 2, acts; as shown in Figs. 13 and 14. H, is the axle on which wheel L and cam V are fastened and on which they turn. K is the wheel on which chain *i*, Figs. 1 and 2 winds when joint lever A, Figs. 1 and 2, is forced down, by car wheels passing over lever, N and K are fastened to one axle so as to move together. F, is a

side view of the signal post F, Fig. 2. T is a signal board. B, is a chain by which signal T, is raised. P and S are wheels. R, is an open space to set a lamp in at night. *c* is a space for chain B, to move in. D, is a groove for signal board T to slide in. G, is a groove, in which the covering of signal board fits.

Fig. 10, is a front elevation of signal posts F, Fig. 2, without its coverings. R, is an open space, for lamp. P and S, are edge views of wheels P and S, Fig. 2. C, is the space for chain B, Fig. 9, to move in. D, is the groove for signal T, Fig. 9, to slide in. G, is a groove in which the covering of signal fits.

Fig. 11 is a front view of signal board T, Fig. 9. B, B, are openings for chain *i*, Fig. 2, to move in, so as to let signal raise, without coming in contact with chain *i*, Fig. 2. R, is an opening through which a lamp can be seen when the signal is down.

Fig. 12 is a covering of signal posts, F, F, Fig. 2. A, is a hole with glass to let light shine through. B, is a hole to let chain and rod pass through.

Fig. 13 is an elevation on a large scale of joint lever A, Figs. 1, and 2, without the cases projecting below the inner part of lever, as shown by dotted lines *c*, *c*, and E, Figs. 3, and 5. N, is a hole for a bolt to secure lever to rail. H, is a bolt securing sections A and B, Fig. 8, together. C, is an open space in the inner part of lever A. G, is the point of lever A, that moves cam V, when car wheels pass from heel to point. E and F, are springs; as shown in Fig. 3. V, is cam; L, is a wheel. D, is the axle.

Fig. 14 is a perspective drawing, on a large scale of joint lever A, lettered and described precisely the same; as Figs. 3 and 13. The joint in lever A, is simply a common rule joint; Secs. A and B, Fig. 8, are laid together, so that point D F, Sec. B, comes in space *c*, Sec. A. Then the covering is put on and sections A and B, are fastened together by a bolt going through hole H, Fig. 7 and through H; of Sec. B Fig. 8 forming a complete and perfect joint; when sections A and B, are fastened together in the manner before described, the joint will move, so as to let G, Fig. 13 move in the covering and close up space C, as shown by dotted lines, so as to let lever A, Fig. 2, move down level with the top of rail, without moving or acting on cam V, as shown in Figs. 3, 13 and 14. This lever can be made with or without the covering projecting below the inner part. Figs. 3, 5 and 6 have the covering below the inner part. Figs. 13 and 14 have only covering over inner part and none below. This is done to show more plainly the working of lever on cam.

In the practical application of my invention, to raising a signal for the purpose of preventing trains of cars coming in opposite direction, from collision, when the track is on a curve, so as to make it impossible to see each other at sufficient distance to avoid collision. In the above case joint lever A, Fig. 2, is placed in the right hand rail, a sufficient distance from the curve; so as to give time to stop, should a train of cars have just passed through the curve; or should a train of cars come on lever A, Fig. 2, while another train of cars was in the curve, coming in opposite directions, so as to give the train in the curve timely notice to back out. Lever A, Fig. 2, when in the rail is forced up by two springs; as shown by E, and F, Figs. 3, 13 and 14 so as not to rest on cam V, Figs. 3, 13 and 14, nor come in contact with V, only when car wheels pass over lever A, from heel to point, forcing down springs, E, and F; Fig. 3, lever A, Fig. 2, comes in contact with cam V; Figs. 3, 13, and 14, turning cam V, and also wheel L, Figs. 3 and 13. When car wheels pass over lever A, Fig. 2, from point to heel; lever A, does not act on, or come in contact with cam V; Figs. 3, 13, and 14, from the fact that when the car wheels come in contact with point of lever A, at G, Fig. 3, the spring E, moves down while the spring F, retains its upright position until space A, Figs 3, and 6 and space C, Fig. 13, are closed; thus moving point G of lever A, Figs. 13 and 14, from over cam V; Figs. 3, 13, and 14. Then the spring F, is forced down and the whole of lever A, Fig. 2, goes down without operating on cam V; but cam V, comes between the outer coverings of lever; as shown by dotted line E, Fig. 5, thus letting train of cars pass over lever A, Fig. 2, from point to heel without operating on cam V, or giving a signal; by this arrangement the signal is only given when the cars are about to enter the curve, and not when having passed through; the post E, Fig. 2, is erected by the side of lever A; Fig. 2, in the lower end of post E, Fig. 2, wheel L, Fig. 9, is placed to which chain A, Fig. 9, is fastened; chain A, goes from wheel L, up past E, to wheel N, Fig. 9, around N, and is made fast to it. Wheels N, and K, Fig. 9, are made fast to and turn, on the same axle. On the top edge of wheel K, post E Figs. 2 and 9, the chain I, Fig. 2, is fastened, going from K, Fig. 2, to T; Fig. 2, at T it is connected to a rod which goes from T bearing on friction wheel *o*, on to T, where it is connected to a chain which goes around wheel S, in the upper end of signal post F; Fig. 2, as shown in Fig. 9, and thus passing on as before described, any number of signals may be used that the length of the curve requires.

In the posts F, and F, Fig. 2, are signals; as shown by T, Figs. 9 and 11. These sig-

nals are raised by means of a chain; as shown by B, Fig. 9. The one end of chain B, is fastened to wheel P; Figs. 2 and 9. The other end of B, is fastened to signal T, Fig. 9 so that when lever A, Fig. 2, is forced down by car wheels passing over A, from heel to point, cam, V, and wheel L, Figs. 3, and 13, will turn, winding up chain A, Fig. 9, on wheel L, Fig. 9, turning wheels N & K, Fig. 9, so that the chain 1, Fig. 2, will wind on wheel K, Fig. 2, and thus turn wheels P, S, and S, P, Fig. 2, and wind up signal chain B, Fig. 9, on wheels P, P, Fig. 2, and thus raise signal T, Fig. 9. When car wheels pass over lever A, Fig. 2, and the springs force the lever up, the signals will lower themselves by means of their own weight. When the curve is long it is intended that the last signal post shall be placed a sufficient distance beyond the curve, so as to give the train about entering the curve, time to pass through after giving the signal, before the approaching train, comes up to the curve, so as to entirely avoid collision, if attention be paid to the signals. At night a lamp will be placed in the posts F, F, Fig. 2 so as to let the light be seen, when the signals are down, a hole being made through the signal board; as shown by R; Fig. 11, when the signal is raised the light can not be seen, but all will be dark, a lamp is only necessary in the night.

In the application of my invention, to turnouts and switches; joint lever A, Fig. 2, is placed in rail C, Fig. 2, at the heel of movable rail M. In this case lever A, Fig. 2, acts on cam V, Figs. 3, 13 and 14, in the same manner; as when applied to raising signals. Cam V, and wheel L, Figs. 3 and 13, are used as before described. Chain G, Figs. 1 and 2, is fastened to wheel L; Fig. 1, as shown on L; in Fig. 9, chain G runs from wheel L, Fig. 1, along rail C, to bar J, in the movable rails M, M; Figs. 1, and 2, where G goes around a pulley and is fastened to bar J, Fig. 1. So that when the car wheels pass over lever A, Fig. 2, going from heel to point, lever A, will act on cam V, turning wheel L, Figs. 3 and 13, and wind chain G, Figs. 1 and 2, on wheel L; Fig. 1, and thus draw movable rails M, M, Figs. 1 and 2, from rails D, D, to rails C, C, Figs. 1, and 2.

Lever B, Fig. 2, is placed in rail D, Fig. 2, facing turnout M, M, Fig. 2, to point G, of lever B, Fig. 4, a chain is fastened, running over wheel F, Fig. 4, along in the rail to bar J, of turnout M, M, Fig. 2. Where chain I, Fig. 4, goes around a pulley and is fastened to bar J, Fig. 1, so that when cars are on the track D, D Fig. 2 and pass over lever B, Fig. 2, forcing the lever down and thus draw turnout M M from track C, C, to track D, D Fig. 2.

By the application of my invention to turnouts they will at all times be regulated by the action of the car wheels on levers A and B, Fig. 2 enabling trains to take the right or left track, as may be regulated in applying levers A and B, to turnouts. I contemplate making levers, A and B, Fig. 2, of wrought or cast iron, also the wheels are cast or wrought.

I wish it distinctly understood that I claim, no part of the wheels, signals or turnout as my invention; these only show its application.

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

The joint lever A, constructed and operating substantially, as herein described and applied on rail roads for the purpose of giving signals and regulating turnouts.

J. W. HOFFMAN.

Witnesses present:
WILLIAM SHARPE,
A. E. HOFFMAN.