

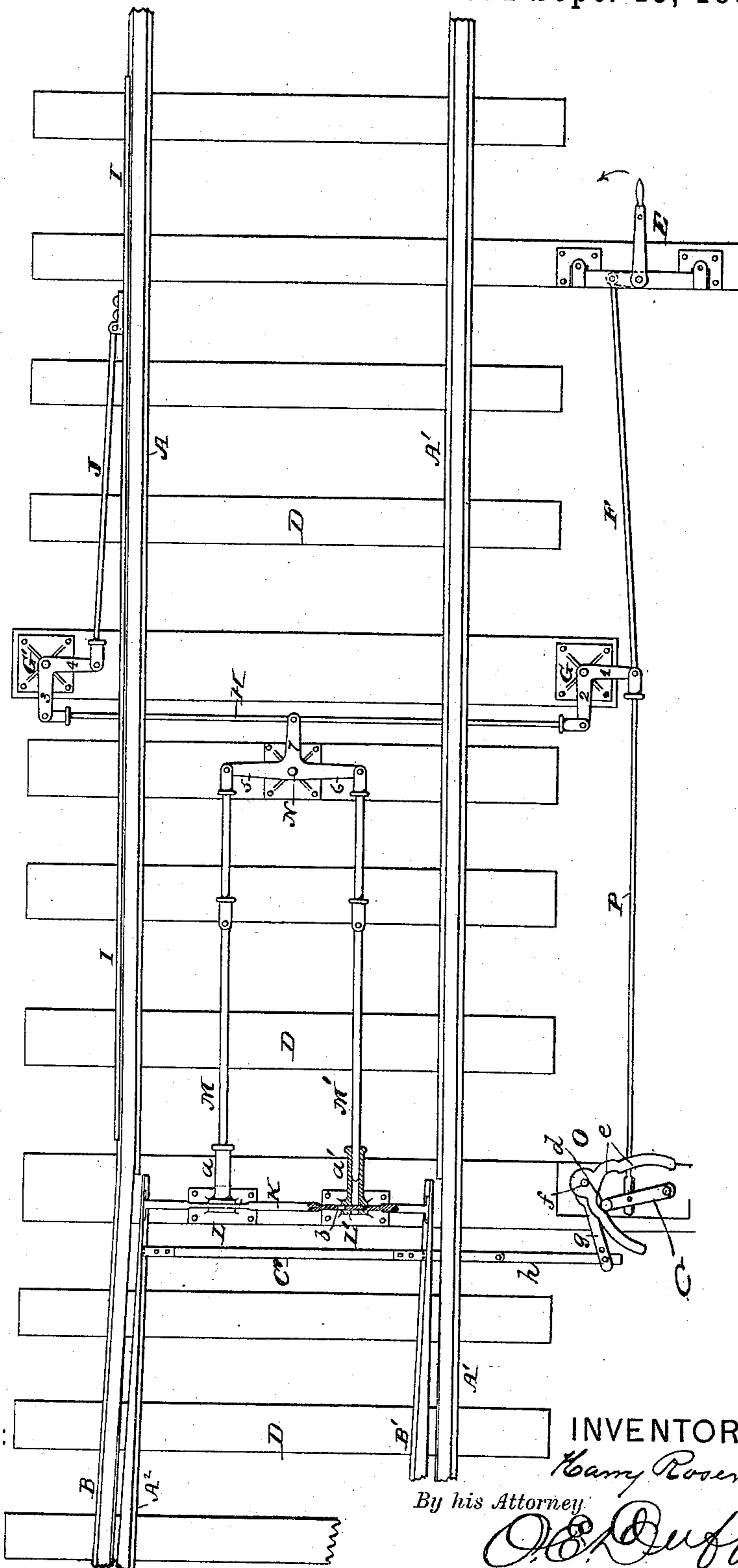
(No Model.)

H. ROSE.

MEANS FOR OPERATING RAILWAY SWITCHES.

No. 369,815.

Patented Sept. 13, 1887.



WITNESSES:

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MEANS FOR OPERATING RAILWAY-SWITCHES.

SPECIFICATION forming part of Letters Patent No. 369,815, dated September 13, 1887.

Application filed March 16, 1886. Serial No. 195,378. (No model.)

To all whom it may concern:

Be it known that I, HARRY ROSER, a subject of the Queen of Great Britain, and a resident of Long Island City, Queens county, New York, have invented certain Improvements in Means for Operating Railway-Switches, of which the following is a specification.

My invention relates to that class of switches for railways wherein the switch-rails are thrown over or shifted from side to side and locked in either position when closed. With such switches a "detector-bar," so called, is usually combined. In such mechanisms it is customary to employ two operating-levers, one to unlock and lock the switch and the other to shift the switch-rails.

By my invention I dispense with one lever and effect the whole operation of unlocking, shifting, and locking by one movement of a single lever.

In the drawing, which serves to illustrate my invention, I have shown the mechanism of a switch in plan, with one of the locking devices in horizontal section. The operating-lever is or may be of the usual kind employed on railways, and needs no detailed illustration.

Let A A' represent the fixed rails of the main track, and A'' the movable switch-rail of the main track. B is the fixed rail of the side track, and B' the movable or switch rail of the side track. These switch-rails A'' B' are pointed at their free ends in the usual way and connected together by a tie-bar, C'.

D D are the ties upon which the rails rest. These are arranged in the usual way.

E represents the operating-lever, which may be arranged with respect to the switch and track in the usual way.

F is a rod connected with the operating-lever E in such a manner that the swinging of said lever over from side to side will impart an endwise movement to the rod, the direction of the movement depending on the direction of the movement of the lever.

All of the above mechanisms and arrangements are in common use, and such levers and rods have before been employed both to lock and unlock a switch and to shift the switch-rails; but, so far as I am aware, this has never been effected by one movement of but one lever, as I have before stated.

G and G' are two bell-cranks pivotally mounted at the sides of the track. The rod F is connected to arm 1 of the bell-crank G, and a connecting-rod, H, extends across the track and connects arm 2 of bell-crank G with arm 3 of bell-crank G'. To the other arm, 4, of bell-crank G' is coupled the detector-bar I, by a rod, J. This crank G' is only employed when such detector-bar is used, and forms no essential part of my invention.

K is a locking-bar which extends across between the points of the switch-rails and is connected therewith. As the switch-rails are shifted, this bar plays back and forth between two pairs of locking-plates, L L', mounted between the rails. Each pair of locking-plates is provided with a bolt or plunger-rod, M M', and the ends of these plungers play through cylinders or guide-tubes a a'.

In the bar K are two apertures or sockets, one of which is seen at b, into which the respective plungers enter when the switch is closed and lock it closed. The locking device at L locks the switch when closed to the main track, and the locking device at L' locks it when closed to the siding.

The plungers M M' are coupled, respectively, to the arms 5 6 of a T or three-armed crank, N, to the third arm, 7, of which the rod H is coupled at its middle.

O represents, as a whole, the concave cam device or eccentric which I employ for shifting the switch-rails. In this resides the most important part of my invention. This device has a vibrating arm, C, which is connected by a rod, P, with the arm 1 of bell-crank G, or to the rod F, as desired. The operation will be the same in either case. The free rounded end d of arm C, when vibrated, plays within a concave cam, e, mounted to vibrate on a pivot or an axis, f. This cam is connected by an arm, g, and link h with the connected switch-rails in such a manner that the vibration of the cam will shift said rails from side to side.

The drawing represents the switch open and unlocked and the moving parts all standing in their middle position.

The operation is as follows: If the operator wishes to set the switch to the side track, he throws over the operating-lever E in the direction indicated by the arrow. This has the

effect at first to shift the switch-rail A" over into contact with the main-track rail A. The cam *e* is so shaped that the rounded end *d* (which may be a roller) of arm C may now play over its surface and allow the further movement of the operating-lever E to push the plunger M through the bolt-hole in bar K at L, which hole will be in coincidence with or opposite to plunger M when the switch is so closed. The switch will now be closed and locked. Now, if the operator wishes to close the switch to the siding he throws the lever E over to the opposite side. The first effect of this movement is to withdraw the plunger or bolt M, so as unlock the switch. This will take place before the switch-rails begin to move, by reason of the form of the cam *e*, which permits the end of arm C to play over its face for a part of the movement without displacing the cam. As soon, however, as the plunger is withdrawn, the cam begins to be displaced by the arm C, and the continued movements of the lever E shifts the switch-rails until rail B' closes to rail A'. When the switch is closed, arm C will have reached a position with respect to cam *e* where said arm may continue to move without displacing said cam; but the movement of lever E will continue until plunger M' shall have passed through the bolt-hole in the locking-bar K and relocked the switch. Thus it will be seen that arm C acts to displace or move cam *e* only during the middle part of the movement of lever E, the first and last portions of the movement of said lever being devoted, respectively, to unlocking the switch and relocking it after the shift. Thus by one movement of the lever E, I effect the several results that were formerly effected by two or more movements of as many levers. The form of cam *e* is very simple, the inner faces of its branches being formed of curves having a radius equal in length to arm C. These curves are drawn from two centers, the distance between which will be governed by the extent to which the cam is to be displaced at each vibration of arm C. To keep the arm in contact with the cam-faces a grooved sheave may be rotatively mounted in the end of the arm, and the faces of the cam chamfered off or rounded to fit in the groove in the sheave.

I have not minutely described the operations of the plungers M M' and the detector-bar I, as these are well-known devices, and their operation will be obvious from inspection of the drawings.

Having thus described my invention, I claim—

1. In combination, the switch-rails, a pair of bolts or plungers adapted to alternately lock and unlock the switch-rails, a vibrating cam having arc-shaped holding-faces and curved cam-operating faces on opposite sides of a line passing through its center of oscillation and through a point midway between the arms of the cam when the latter is at mid-stroke, a vibrating lever adapted to alternately engage the said faces in the cam, a single operating-lever and connection between the single operating-lever and the locking mechanism and the cam-operating lever and between the vibrating cam and the switch-rails, whereby the movements of the single operating-lever release, shift, and lock the rails at well-defined steps of the stroke, substantially as set forth.

2. In combination, the single operating-lever, the connected bell-crank and three-armed levers, the former connected with the single operating-lever and the latter with the locking-plungers, the vibrating two-armed cam connected with the movable rails and the vibrating lever for operating the two-armed cam, the latter connected with the single operating-lever, whereby the switch is set for either the main or side track and locked in position by the movement of a single lever, substantially as set forth.

3. A switch mechanism constructed substantially as herein described, consisting of the switch-connecting rods, the two cylinders and their plungers, the three-armed crank N, bell-cranks G G', detector-bar, operating-lever E, and the several connections arranged and operating to unlock, shift, and lock the switch by a single movement of the operating-lever, substantially as set forth.

4. A combined switch shifting and locking device having the cylinders and plungers, the cam, the cam-arm, and means for operating the same, in combination with the transverse rod H and the detector-bar with its operating mechanism, the whole being adapted to receive motion from a single lever, as set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

HARRY ROSER.

Witnesses:

HENRY CONNETT,
ISAAC NASH.