

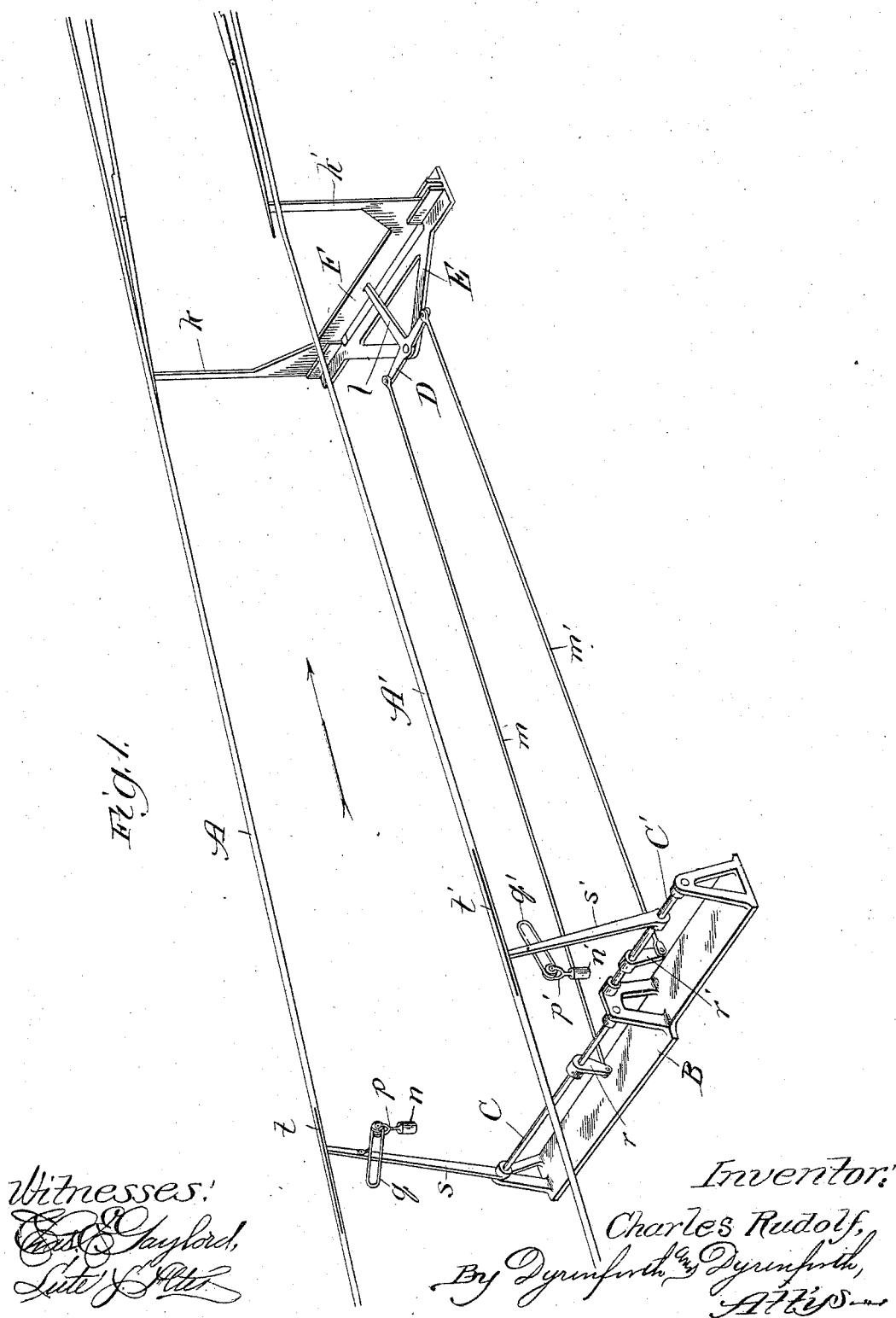
(No Model.)

2 Sheets—Sheet 1.

C. RUDOLF.
AUTOMATIC RAILWAY SWITCH.

No. 579,332.

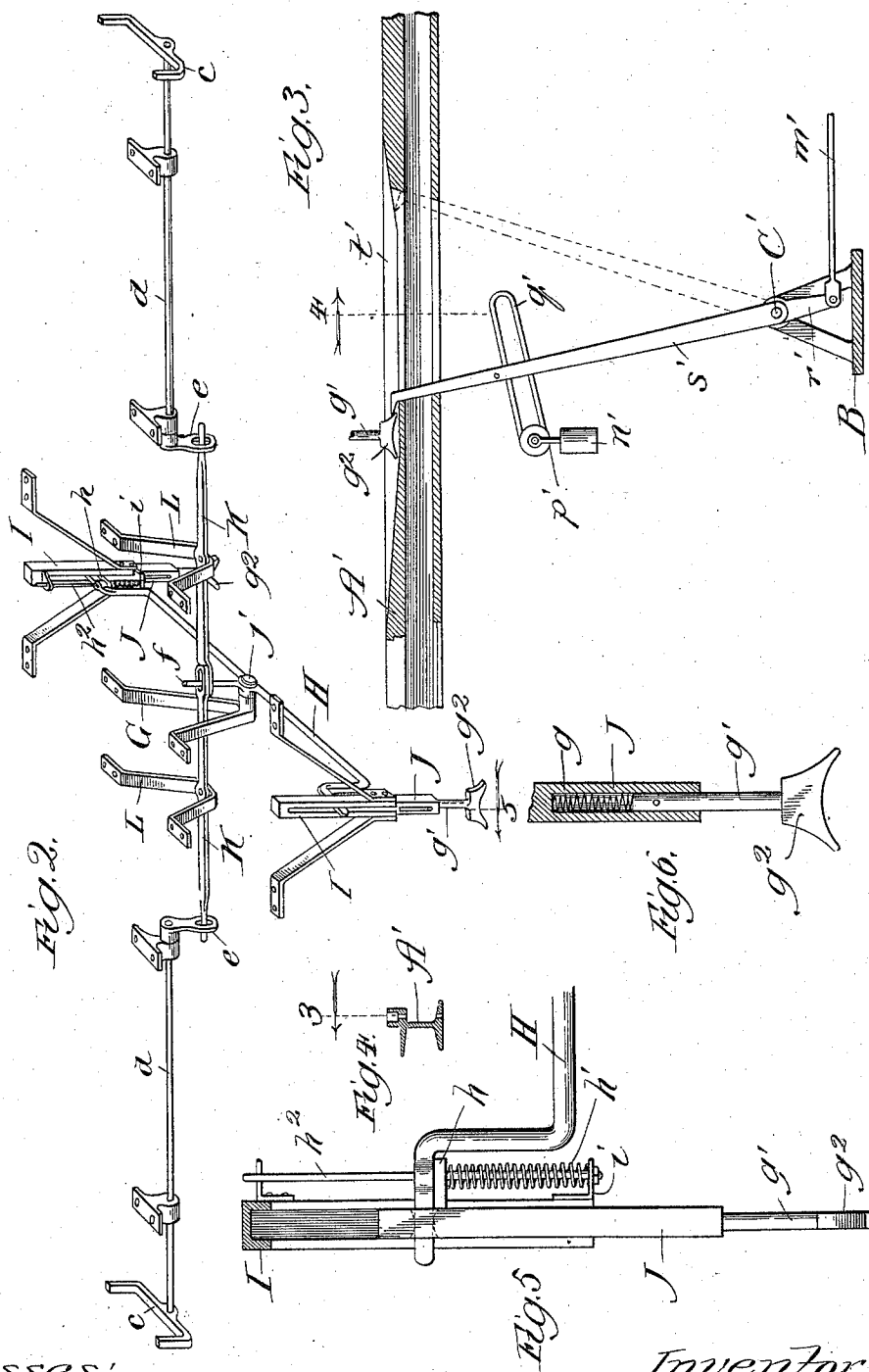
Patented Mar. 23, 1897.



C. RUDOLF.
AUTOMATIC RAILWAY SWITCH.

No. 579,332.

Patented Mar. 23. 1897.



Witnesses:
E. C. Chayford,
L. E. S. S. S.

Inventor:
Charles Rudolf,
By Dyrnforth & Dyrnforth,
Attys.

UNITED STATES PATENT OFFICE.

CHARLES RUDOLF, OF CHICAGO, ILLINOIS.

AUTOMATIC RAILWAY-SWITCH.

SPECIFICATION forming part of Letters Patent No. 579,332, dated March 23, 1897.

Application filed December 7, 1896. Serial No. 614,762. (No model.)

To all whom it may concern:

Be it known that I, CHARLES RUDOLF, 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 Automatic Railway-Switches, of which the following is a specification.

My invention relates to an improvement in automatically-operated railway-switches, my primary object being to provide simple and effective switch mechanism for use in connection with double-track railways—that is to say, railways having separate going and returning tracks; but while I show and describe my invention in connection with such a track it will appear readily that the device may be adapted easily to any track by simply duplicating certain of the parts.

Generally stated, my invention involves a rock-shaft extending transversely beneath the track, provided with an upwardly-extending arm, a crank rigid with the shaft and connected with a lever for moving the switch, a second rock-shaft similarly provided with an upwardly-extending arm and a crank-arm so connected with the lever that one of said upwardly-extending arms shall be set in position for a following train when the other is moved to throw the switch, and means upon the train to be operated at will to engage the appropriate arm for moving the switch in the desired direction.

Referring to the accompanying drawings, Figure 1 represents a view in perspective of a track and switch provided with the road-bed portion of my improved switch-operating mechanism; Fig. 2, a similar view of the detached car attachment, and Figs. 3, 4, 5, and 6 details of the construction.

A A' are main-track rails provided at the tread portion with longitudinally-extending slots *tt'*. Extending transversely beneath the track is a support B, which affords bearings for rock-shafts C C', provided with upwardly-extending lever-arms *s s'* and with cranks *r r'*, respectively. The arms *s s'* are provided with bracket-supported cross arms or tracks *q q'*, upon which are mounted movable carriers *p p'*, carrying weights *n n'*, and are sheathed at their upper ends within the slots *tt'*. The crank-arms *r r'* are pivotally joined to connecting-rods *m m'*, respectively, which

are pivoted at their free ends to the opposite ends of a transverse lever D. The lever D is pivoted at the center of its length to a suitable support E and provided centrally with a branch arm *l*, which projects into a slot in a transversely-movable switch-slide F, fitted to move within guides upon the support E and provided at its opposite ends with upwardly-projecting fingers *k k'*, which engage slots (not shown) in the ends of the switch-rails.

The mechanism for operating the lever-arms *s s'*, designed to be carried beneath the car-body, is shown in Fig. 2. It comprises vertically-movable lever-engaging shoes, a transversely-extending lever pivoted at its center and engaging the shoes at its ends, and means for tilting the lever in a vertical plane to press down one of the lever-engaging shoes, as desired.

Located centrally beneath the car-body is a bracket G, provided with a horizontally-disposed longitudinally-extending bearing *j*, upon which is pivoted a transversely-extending lever H. The ends of the lever H move within bracket-supported guides I, located directly above the rails, and which also form ways for slides J. The guides I and slides J are provided with lugs *i* and *h*, respectively, between which are confined springs *h'*, coiled about rods *h²*, which serve to hold the slides in their normally-elevated position and to keep the lever H horizontal. The ends of the lever are slotted to receive the rods *h²*. Each slide J is provided at its lower end with a socket within which is confined a spring *g*, which bears upon the shank *g'* of a lever-operating shoe *g²*. The shoe is insured against turning by pin-and-slot connection between the shank *g'* and the slide J and is held normally at the lower end of its traverse by the spring *g*.

The lever H is provided with an upwardly-extending tilting arm *f*, which is engaged by the slotted ends of levers K, which connect with opposite ends of the car. Each lever K is centrally pivoted upon a bracket L and has its free end reduced to enter a slot in a crank *e*, which is rigid with a longitudinally-extending rock-shaft *d*, suitably supported beneath the car-body and provided at its free end with upwardly-turned tilting arms *c*,

which serve as pedals to be operated by the driver.

Figs. 3 and 4 show the arrangement of the slots in the rails and the manner in which the operating-shoe enters to engage the operating-lever at the beginning of the movement and is finally disengaged therefrom as it follows the contour of the slot to the end of the movement. For this purpose the upper portion of said slot is widened, as shown in Fig. 4, and both the entrance and exit ends provided with longitudinally-sloping surfaces, as shown in Fig. 3, that of the latter being slotted to provide a recess into which the operating-lever retreats to allow said disengagement. The great utility of sheathing the operating-levers within the slotted rails is self-evident, especially in the case of surface street-railways.

The operation is as follows: Suppose a train approaching in the direction of the arrow shown in Fig. 1 and that it is desired to keep the main track. It would be necessary to move the switch-rails to the right. This would be done by pressing down upon the right tilting arm *c*, which would rotate the crank *e* on the rock-shaft *d* to the left, thereby moving the opposite end of the lever *K* to the right, and consequently tilting the right end of the lever *H* downward and forcing the slide *J* downward against the resistance of the spring *h'*. When the shoe *g*² bears upon the track, further pressure compresses the spring *g*, the resilience of which forces the shoe to enter the slot in the rail when it is reached and there to engage the lever-arms *s'*. Through the medium of the lever-arm *s'* the rock-shaft *C'* is rotated, and through the crank-arm *i'* and the connecting-rod *m'* the lever *D* is moved to force the switch-slide *F*, which is connected with the switch-rails, to the right. It is evident from a view of the connections shown in Fig. 1 that the simultaneous movements of the rock-shafts *C'* and *C* are in opposite directions, so that in the forward movement of the lever-arm *s'* the lever-arm *s* is moved in the opposite direction, and is consequently in position to be engaged by the left shoe on a succeeding train to throw the switch in the opposite direction should it be desired. The function of the weights *n n'* is to lock the switch in the position to which it has been thrown. It is further evident that by a duplication of certain of the parts of the track mechanism arrangement could be made whereby the switch could be thrown by a train approaching from the opposite direction and upon either track.

In thus minutely describing my preferred construction I wish to be understood as in no sense limiting myself in matters of detail except as shall appear from the appended claims.

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

1. In a railway-switch, the combination with the switch-rails, of a switch-slide engag-

ing said rails, a centrally-pivoted lever provided with a branch arm engaging said slide, two rock-shafts extending transversely of the track, lever-arms upon the rock-shafts projecting into the path of an attachment upon the train, crank-arms upon said shafts, and connecting means between the crank-arms and said centrally-pivoted lever, whereby as the switch is thrown by actuating one of said lever-arms in one direction, the other lever-arm is turned in the opposite direction to be set for a succeeding train, substantially as set forth.

2. In a railway-switch, the combination with a switch-rail of a switch-slide engaging said rail, a rail provided in the tread portion with a longitudinal slot having its upper portion widened and provided at its exit end with a recessed sloping surface, and means extending into said slot to be engaged from a passing train and connected with the switch-slide to operate it by said engagement and be released from the train attachment by said surface, substantially as and for the purpose set forth.

3. In a railway-switch, the combination with a switch-rail, a switch-slide engaging therewith, a guide for the slide, a centrally-pivoted lever provided with a branch arm engaging the switch-slide, two rock-shafts extending transversely of the track, a support for the shafts, slotted rails above the shafts, lever-arms upon the shafts having their upper ends sheathed in said slots, crank-arms upon the shafts, and connecting-rods extending from said crank-arms to the opposite ends of said centrally-pivoted lever, whereby the lever-arm upon one rock-shaft is set for a succeeding train as the other is moved forward by the passing train to throw the switch, substantially as and for the purpose specified.

4. In a railway-switch, the combination of a movable switch-rail, a switch-slide engaging therewith, two rock-shafts extending transversely of the track, lever-arms upon the rock-shafts projecting into the path of an attachment upon the train, cross arms or tracks upon said lever-arms, movable carriages carrying weights upon the tracks, crank-arms upon the shafts, and connecting means between the crank-arms and switch-slide whereby as the switch is moved by the movement of one of the rock-shaft lever-arms in one direction the other is moved in the opposite direction to be in position for engagement by a succeeding train, as and for the purpose set forth.

5. In a switch-operating mechanism, the combination of a slotted rail, operating means connected with the switch-rail projecting into said slot, and a train attachment comprising a vertically-movable slide, a movable operating-shoe, spring connection between said slide and shoe, and means for lowering the slide at will to compress the spring and force the shoe into said slot to throw the switch, substantially as and for the purpose set forth.

6. A switch-operating train attachment for
actuating at will a switch-rail lever connec-
tion in the track, comprising a vertically-
movable slide, a spring holding said slide nor-
mally in its raised position, a spring-held shoe
5 moving in said slide, and means for depress-
ing the slide, substantially as described.

7. In a switch-operating mechanism, a train
attachment comprising, in combination, a
10 centrally-supported lever H, having a tilting
arm *f*, guides I, slides J, shoes *g*², a centrally-

pivoted lever K engaging at one end the tilt-
ing arm *f*, a rock-shaft *d* provided with a
crank-arm *e* engaging the free end of the lever
K, and tilting arms *c* upon the shaft *d*, all ar- 15
ranged substantially as and to operate in the
manner specified.

CHARLES RUDOLF.

In presence of—

R. T. SPENCER,
J. H. LEE.