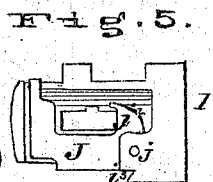
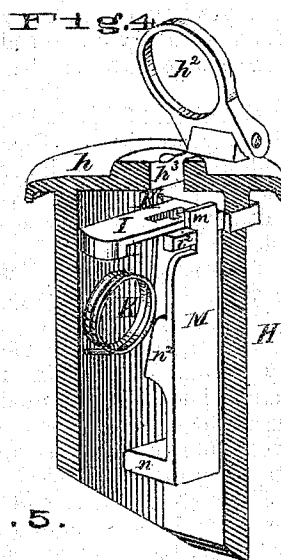
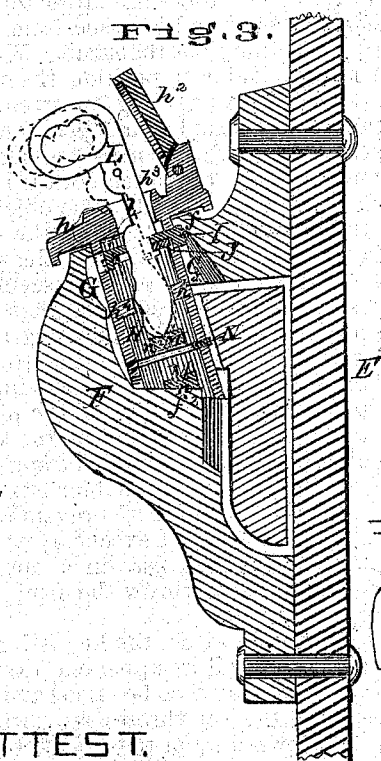
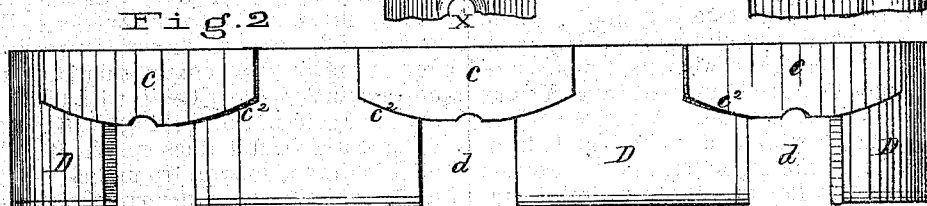
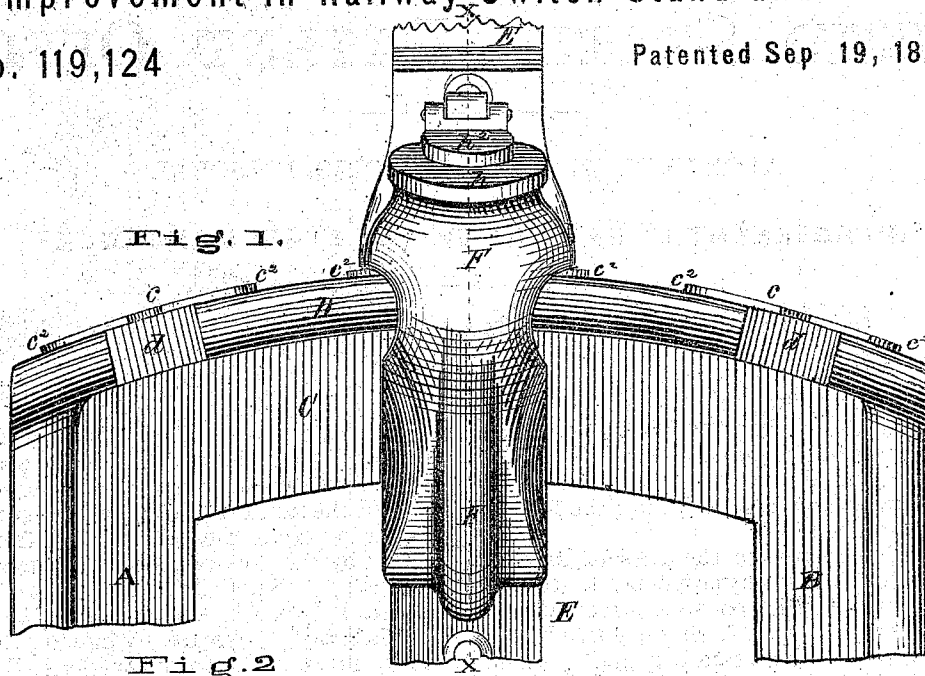


ALONZO W. CRAM.

Improvement in Railway Switch-Stand and Lock.

No. 119,124

Patented Sep 19, 1871.



ATTEST.
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Walter Allen

INVENTOR.
Alonzo W. Cram
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UNITED STATES PATENT OFFICE.

ALONZO W. CRAM, OF ST. LOUIS, MISSOURI.

IMPROVEMENT IN RAILWAY-SWITCH STANDS AND LOCKS.

Specification forming part of Letters Patent No. 119,124, dated September 19, 1871.

To all whom it may concern:

Be it known that I, ALONZO W. CRAM, of the city and county of St. Louis and State of Missouri, have invented a new and useful Improvement in Railway-Switches, of which the following is a specification:

My invention relates to the class of railway switches made to lock in any proper position of the switch; and my invention consists, principally, in the following provisions: A single guide-bar is used for the switch-lever, said bar having a side flange that is notched to receive a drop-bolt, which rides upon the said flange between the notches, and whose lower end is forced outward by guides at the notches to allow its descent therein. The lock is constructed with a drop-bolt and drop-tumbler to engage the guide-bar and to prevent the removal of the key when the switch is unlocked, respectively. The arrangements are such that the lever is self-locking upon being brought into position, and when the key is withdrawn the lock is covered, so that no rain can enter either the locking-bolt or the space between the bolt and strap.

Figure 1 is a front elevation of part of a railway switch embodying my invention. Fig. 2 is a top view of the guide-bar. Fig. 3 is a section at the line *x x*, Fig. 1. Fig. 4 is a diagonal section of the locking-bolt. Fig. 5 is a bottom view of the bolt and tumbler of the lock.

A B are standards of the guide-frame. C is the guide-bar, having a projecting side flange, D, that has a number of rectangular notches, *d*, to receive the drop-bolt. At the rear of each notch and extending backward and sidewise from the same is a flattened elevation, *c*, whose inclined edges *c*² force the lower end of the drop-bolt outward when it is approaching the notch so as to put it into position to drop into said notch. E is the switch-lever. F is a strap, whose ends are attached to the lever E, and which extends in front of the guide-bar, and whose upper part has a vertical perforation, G, containing the drop-bolt. The drop-bolt has a square tubular case, H, with a flanged head, *h*, that projects sufficiently upon all sides to protect the aperture G from rain and sleet. Hinged to the cap is a drop-lid, *h*², to protect the key-hole *h*³. I is the bolt, shown in Fig. 3 as engaged beneath the lip *f* of the strap, in which position of the spring-bolt I the drop-bolt cannot be raised to release the lever E. The bolt

I has one or more tumblers, J, pivoted at *j*, and acted on by a spring, K, so that when the key L is removed from the lock the tumblers prevent the retraction of the bolt. When the key is introduced the tumbler or tumblers are turned into position to permit the bolt to slide from under the lip *f* by the pressure of the key against the projection *j*². (See Fig. 5.) The point of the key, L is held between two fulcrum-lugs, *h*⁴, and the bolt I is drawn backward by moving the top of the key outward away from the lever E. When the top of the key is drawn outward the front edge of the key-hole enters a notch, *l*, in the key and prevents the key being withdrawn until the bolt I is again in the locking position, as shown in Fig. 4 and in full lines in Fig. 3. When the bolt I is drawn forward to unlock the lever the lug *i*², (see Fig. 4,) is drawn from beneath the side projection *m* at the upper end of the drop-tumbler M and allows the latter to fall, which it does as its lower end is raised from the lug or inward projection *f*² of the strap. When the tumbler M is in its lower position the projection *m*, by resting against the lug *i*², prevents the return of the bolt into the locking position, so that the key cannot be withdrawn, as the front edge of the key-hole rests in the notch *l* of the key, as shown by dotted lines in Fig. 3. The object of rendering the key irremovable when the switch is unlocked is the avoidance of accidents by neglect of the switch-tender to properly secure the switch in position, he being reminded that the switch is insecure by his inability to remove the key from the lock. The movement of the drop-tumbler M is limited by a screw-pin, N, and lugs *n* *n*² upon the said tumbler; the end of the pin also limiting the upward movement of the drop-bolt by catching beneath the lip *f*. The spring K presses against the side of the tumbler or tumblers J to hold them in position to prevent the slipping backward of the bolt I except by use of a proper key. The spring K rests in a notch, *i*³, of the bolt, and tends to throw the same out into the locking position.

To move the switch, the key is inserted in the top of the lock and its upper end drawn forward. The drop-bolt may then be raised and the forward pressure on the key throws the lower end of the drop-bolt inward upon the top of the raised part *c* of the guide-bar, and when the lever is swung over to the right or left the lower end of the

drop-bolt slides along the top of the guide-bar until it comes in contact with the inclined side of the next raised portion *c*, and is by the latter thrown outward over the notch *d*, into which it falls. As the drop-bolt descends the lower end of the drop-tumbler *M* strikes the projection *f*², by which it is thrown upward, and allows the spring-bolt to be thrown by the spring into the locking position, and as the key is drawn out the spring turns the tumblers *J* so that the bolt *I* cannot be forced from under the catch *f*.

I claim—

1. The single-flanged and notched guide-bar *C*

D d, substantially as and for the purpose set forth.

2. In combination with the guide-bar *C D d*, the inclined raised portions *c*, for the purpose described.

3. The drop-bolt, consisting essentially of the case *H*, bolt *I*, tumblers *J* and *M*, spring *K*, and strap *F f f*², substantially as set forth.

In testimony of which invention I hereunto set my hand.

Witnesses:

ALONZO W. CRAM.

SAML. KNIGHT,

HENRY G. ISAACS.

(91.)