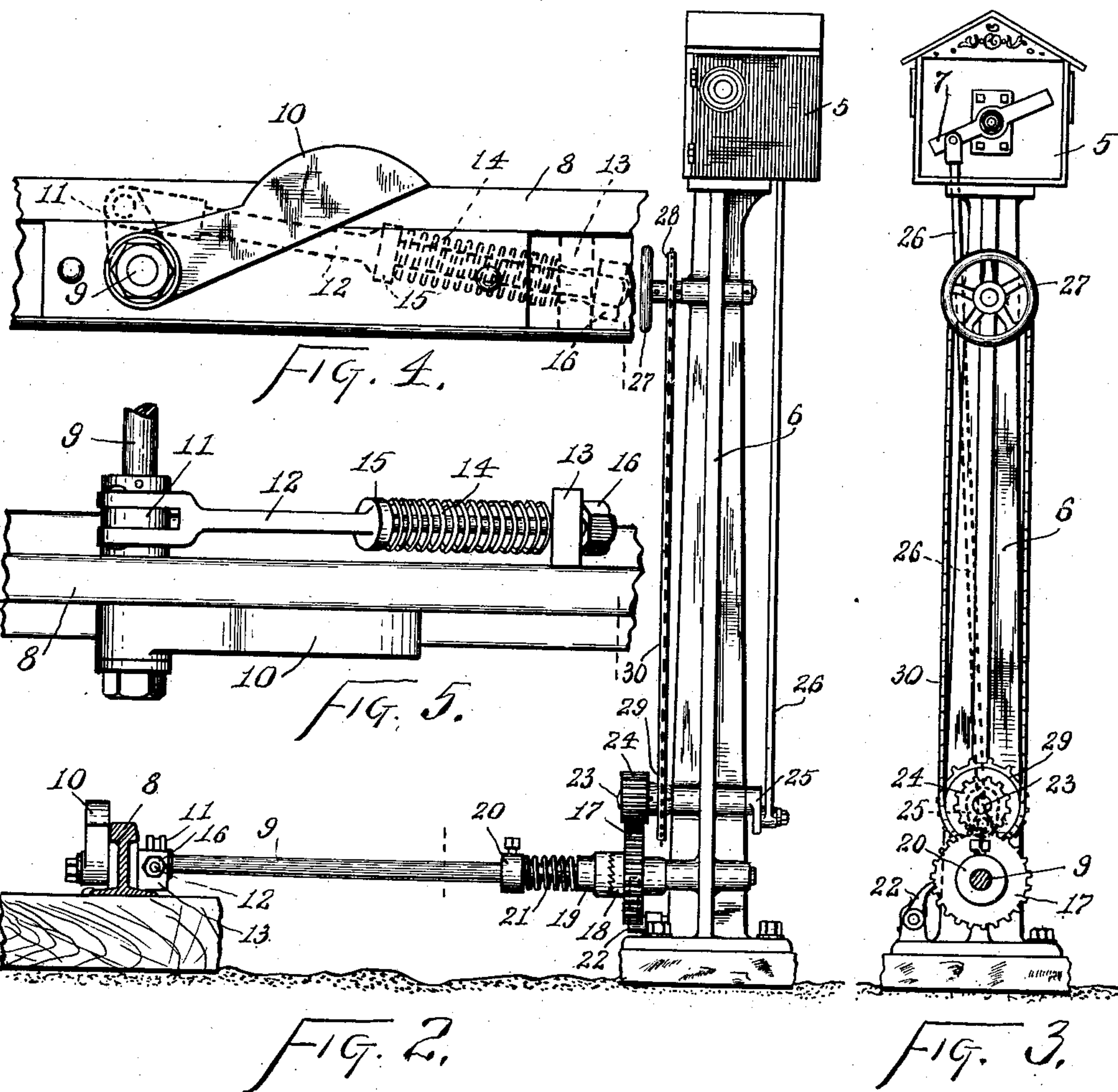
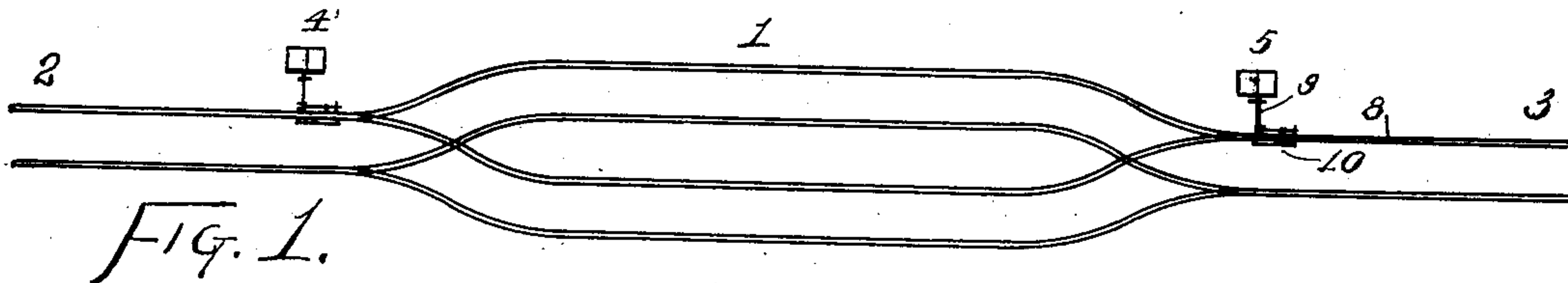


No. 721,136.

PATENTED FEB. 24, 1903.

C. E. BAKER.  
RAILWAY SIGNAL DEVICE.  
APPLICATION FILED AUG. 15, 1902.

NO MODEL.





# UNITED STATES PATENT OFFICE.

CHARLES E. BAKER, OF TRENTON, OHIO.

## RAILWAY SIGNAL DEVICE.

SPECIFICATION forming part of Letters Patent No. 721,136, dated February 24, 1903.

Application filed August 15, 1902. Serial No. 119,769. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES E. BAKER, a citizen of the United States, residing at Trenton, Butler county, Ohio, (post-office address 5 Trenton, Ohio,) have invented certain new and useful Improvements in Railway Signal Devices, of which the following is a specification.

It has heretofore been proposed to cause the 10 signal devices to be automatically actuated by the passing cars, and my present invention pertains to mechanism designed to bring about this automatic operation.

My invention will be readily understood 15 from the following description, taken in connection with the accompanying drawings, in which—

Figure 1 is a plan of a turnout provided with one of my improved signal devices at each of 20 its ends; Fig. 2, a side elevation of the signal device, the rail with which it is connected appearing in vertical transverse section; Fig. 3, a front elevation of the signal device, its actuating-shaft appearing in vertical transverse 25 section; Fig. 4, an inside face view of a portion of the rail which carries the tappet, and Fig. 5 a plan of the same.

In the drawings, 1 indicates an ordinary turnout in a single-track railway; 2, one 30 portion of the main track connected therewith and going, say, toward the west; 3, the other portion of the main track connected with the turnout and coming, say, from the east; 4, one of the usual signal-boxes erected along- 35 side track 2 where it enters the turnout, this signal-box to contain the usual signal apparatus in the way of lamps, semaphores, or the like and to be connected, as usual, with the other signal-boxes of the system; 5, a similar 40 signal-box erected alongside track 3 where it enters the turnout, description being herein-after confined to this signal-box and its accessories, as the various signal-boxes of the system are alike; 6, the post supporting the 45 signal-box; 7, the usual signal within the signal-box; 8, a rail contiguous to the signal-box; 9, a shaft journaled in the rail and extending at right angles therefrom out to the 50 post of the signal-box, in which it is journaled; 10, a tappet secured to the inner end of this shaft and lying alongside the inner face of the head of the rail in position to be

overrun and depressed by the flange of a wheel of a passing car, the tappet normally occupying its upward position; 11, an arm on 55 shaft 9; 12, a spring-rod connected with this arm; 13, an abutment guiding the outer end of rod 12 and secured, preferably, to the outer face of the rail in which shaft 9 is journaled; 14, a spring upon rod 12, abutting against 60 guide 13; 15, a collar on rod 12 at the inner end of the spring, whereby the spring tends to turn shaft 9 and maintain tappet 10 in its upper position; 16, a stop-nut on the outer 65 end of rod 12, adapted to engage abutment 13 and properly limit the upward motion of the tappet; 17, a gear loose on shaft 9 at the foot of the post of the signal-box; 18, a clutch-hub on gear 17; 19, a sliding clutch 70 splined on shaft 9 and normally engaging clutch 18, the teeth of these clutches being in ratchet form, with such direction of action that motion of shaft 9 due to the depression of the tappet tends to turn gear 17 forward, while motion of shaft 9 due to the rising of the tappet is inactive upon the gear; 75 20, a collar on shaft 9; 21, a spring on shaft 9 between collar 20 and clutch 19 and serving to hold the clutches normally engaged and to permit the inactive retreating motion of 80 shaft 9 as the tappet rises; 22, a stop-pawl acting on gear 17 and preventing its retreating motion; 23, a counter-shaft journaled at the foot of the post near shaft 9; 24, a pinion 85 fast on this shaft and engaging gear 17 and having a diameter equal to half that of gear 17; 25, a crank on shaft 23; 26, a link connecting the crank with signal 7 in the signal-box, whereby one extreme position of the 90 crank corresponds with one extreme position of the signal and a half-turn of the crank puts the signal to its other extreme position; 27, a hand-wheel shaft journaled in the post of the signal-box in convenient position to be 95 reached by motorman or conductor; 28, a sprocket-wheel on this shaft; 29, a sprocket-wheel on counter-shaft 23, and 30 a chain connecting the two sprocket-wheels, whereby the crank may be turned in the advancing direction of motion by hand. 100

There being eight wheels to a car, it follows that each passing car will depress the tappet four times. The stroke of the tappet as effected by the flange of a passing wheel is to



be such that the four depressions will produce a quarter-turn of shaft 9, equal to a half-turn of crank 25, or in case the gears are otherwise proportioned so that four depressions of the tappet will produce a half-turn of the crank. It follows that with signal 7 at one extreme position the passing of a car will put the signal to the other extreme position, and this is quite independent of the direction of motion of the car.

Now assume signal at 4 to be at "safety," indicating that the block ahead to the west is clear, and assume a car approaching from the east on track 3, the signal at 5 being to "danger," all as usual. The car in passing signal 5 depresses the tappet at that signal four times and throws the signal at that box to the other extreme. The signal effect will be as usual—that is to say, the signal at box 5 will go to "safety," as will also the signal at the western end of the preceding turnout, thus indicating that block 3 is clear. As signal 4 shows "safety," the car proceeds onward past it into block 2; but in passing signal 4 its tappet becomes depressed four times and the signal put to "danger," as is also the signal at the western end of block 2. It is thus seen that each car passing a signal-box reverses the signal at that box and also appropriately at other boxes of the system.

The levers 7 of signals 4 and 5 may be connected mechanically, as by a wire, or they may operate switches in an electric-wire connection or by other known connections. Such connections in railroad signaling are common and well understood and need not therefore be illustrated.

Thus far it has been assumed that the apparatus is used in an absolute block system; but in a permissive block system two cars may be on a block at one time under order. In such case it will be apprehended that the first car leaving a block would in passing the tappet change the danger-signal to "safety," when, in fact, the second car was still on the block. For this reason provision is made for undoing the result of the automatic action. The first car in passing the signal as it leaves the block will automatically reverse that signal; but it is the duty of the motorman or

conductor to operate hand-wheel 27 and restore the signal to "danger," and so with each succeeding car upon the block, except the last one which may be occupying the block, which last car will leave the signal at "safety;" so, also, as to the signal at the beginning of the block. The first car of a plurality of cars entering the block under the permissive system puts the signal to "danger." The next car would automatically put it to "safety," but it is the duty of the motorman or conductor to restore it to "danger" by hand.

The signal 7 may be a pivoted semaphore, one arm of which when elevated may denote "danger" and when depressed "safety," or the signal 7 may be a signal-operating arm for actuating an electric switch which will show a danger-signal at one limit of its movement and a safety-signal at the other limit of its movement in a manner well understood and not necessary to be particularly described.

I claim as my invention—

1. In a railway signal device, the combination, substantially as set forth, of a rail, a signal, a shaft mounted at right angles to the rail, a tappet on the shaft in position to be depressed by the passing of a car-wheel, a spring urging the tappet to elevated position, a crank, a connection therefrom to the signal, and mechanism connecting the shaft and crank whereby four depressions of the tappet will produce a half-turn of the crank.

2. In a railway signal device, the combination, substantially as set forth, of a rail, a signal, a shaft mounted at right angles to the rail, a tappet on the shaft in position to be depressed by the passing of a car-wheel, a spring urging the tappet to elevated position, a crank, a connection therefrom to the signal, mechanism connecting the shaft and crank whereby four depressions of the tappet will produce a half-turn of the crank, and hand mechanism for turning said crank independent of said shaft.

CHARLES E. BAKER.

Witnesses:

J. W. SEE,  
E. R. SHIPLEY.