

(No Model.)

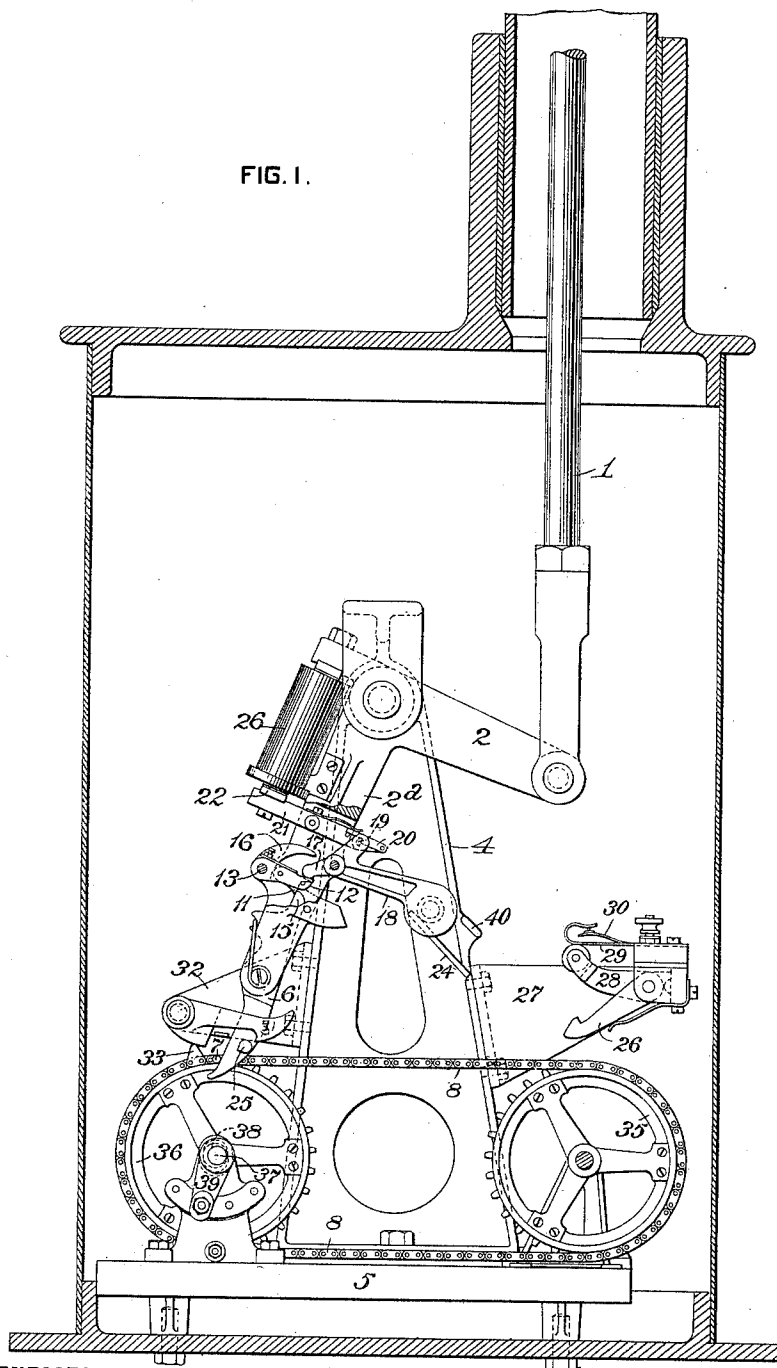
2 Sheets—Sheet 1.

V. K. SPICER.  
SIGNALING APPARATUS.

No. 600,385.

Patented Mar. 8, 1898.

FIG. 1.



WITNESSES:

*Chas. F. Miller.*  
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INVENTOR.

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*by Danm B. Wolcott*

Att'y.

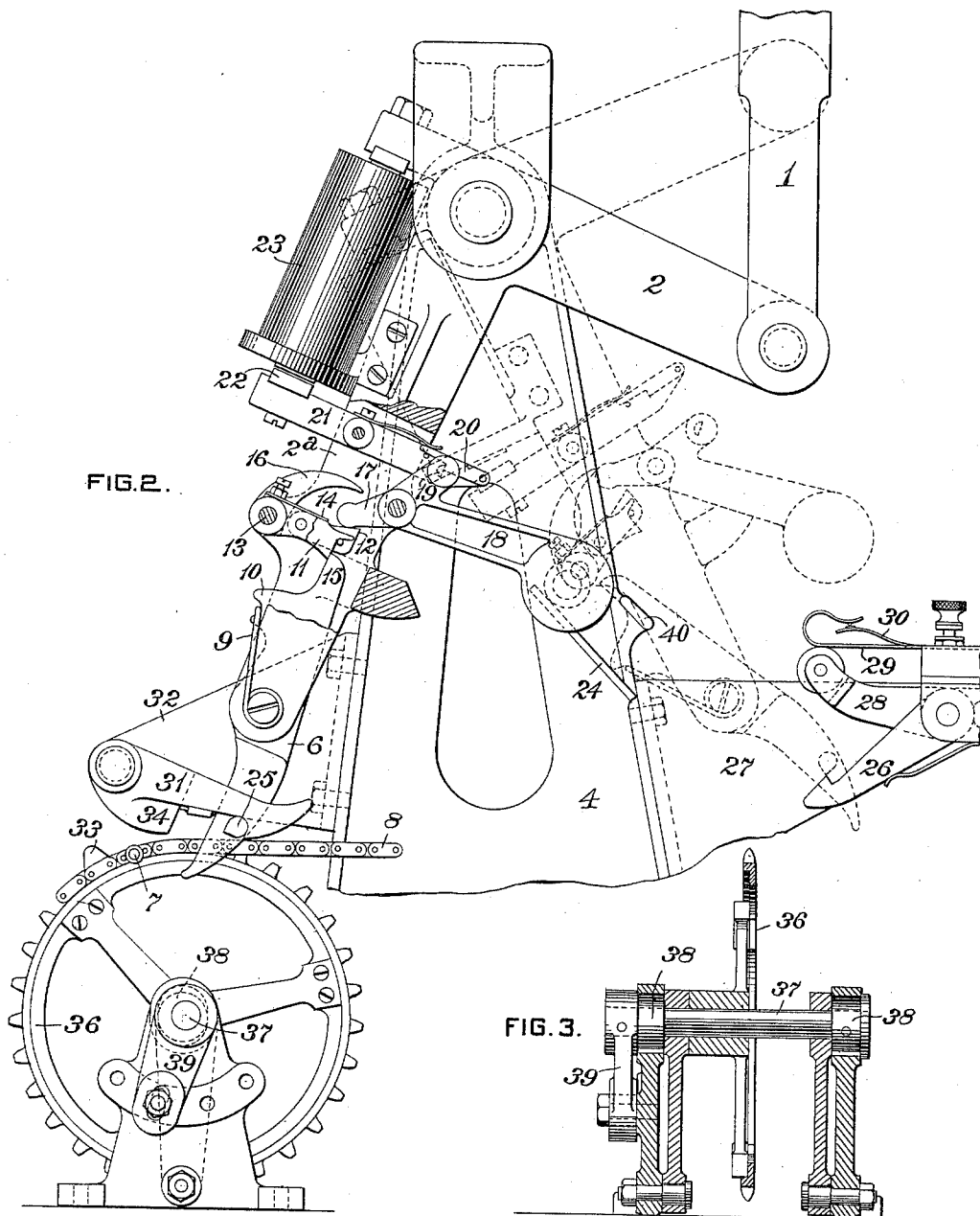
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# UNITED STATES PATENT OFFICE.

VIBE K. SPICER, OF KENILWORTH, ILLINOIS, ASSIGNOR TO THE UNION SWITCH AND SIGNAL COMPANY, OF SWISSVALE, PENNSYLVANIA.

## SIGNALING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 600,385, dated March 8, 1898.

Application filed July 13, 1897. Serial No. 644,376. (No model.)

*To all whom it may concern:*

Be it known that I, VIBE K. SPICER, a citizen of the United States, residing at Kenilworth, in the county of Cook and State of Illinois, have invented or discovered certain new and useful Improvements in Signaling Apparatus, of which improvements the following is a specification.

The invention described herein relates to certain improvements in automatic signals for railways, and has for its object a construction and arrangement of mechanism whereby a signal may be set to clear position by the operation of an electric motor, which in turn is controlled by the signal in its movement to and from clear position, and whereby the movement of the signal to danger position is controlled by train movements.

The invention is hereinafter more fully described and claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 is a view in elevation showing the operating and controlling mechanism connected to a signal-rod. Fig. 2 is a similar view showing the several parts, on an enlarged scale, with the signal at danger and clear positions, the latter being shown in dotted lines; and Fig. 3 is a sectional detail view illustrating the mechanism employed for adjusting the driving-chain.

In the practice of my invention the signal-rod 1 is pivotally connected at its lower end to the arm 2 of a bell-crank lever, which is pivotally supported upon a suitable standard 4, secured to the base 5 of the machine. The other arm 2<sup>a</sup> of the lever has a finger 6, pivotally mounted thereon, and so constructed and arranged that its lower end will project down into the path of movement of a pin 7 on the driving-chain 8. The upper end of the finger 6 projects up between the prongs forming the lower end of the arm 2<sup>a</sup> of the lever, and the finger is normally held in approximate alinement with the arm 2<sup>a</sup> by a spring 9, having one portion suitably secured on the arm 2<sup>a</sup>, while another portion will bear against a shoulder or projection 10 on the finger. The finger is locked in its normal position by a catch 11, loosely mounted in an arm 12, secured to a shaft 13, which is mounted in suitable bearings in the arm 2<sup>a</sup>. The catch 11 is yieldingly held by a spring 14, so as to

project beyond the arm 12 and engage a toe 15 on the upper end of the finger 6 when the arm has been shifted to normal position, as will be hereinafter described. A horn 16 is also so secured to the shaft 13, or the horn and arm 12 may be formed integral with each other, that the former will project over into the path of movement of a lug 17, formed on the weighted arm 18, which is pivotally mounted on the arm 2<sup>a</sup> of the bell-crank lever. The weighted arm 18 is provided with a pin or shoulder 19, adapted when the several parts of the mechanism are in normal position to engage a spring-finger 20 on the lever 21, which is pivotally mounted on the arm 2<sup>a</sup>. At its opposite end this lever 21 has secured to it the armature 22 of the magnet 23 also mounted on the arm 2<sup>a</sup>, and forming a part of a track-circuit or of another circuit controlled by the track-circuit.

In Figs. 1 and 2 the mechanisms thus far described are shown with the signal in danger position, and the weighted arm having been so shifted by contact with the plate 24 that the pin 19 is in engagement with spring-catch 20 on the armature-lever 21 and the arm 12 has been moved down by the lug 17, so that the catch 11 is in engagement with the toe 15. If now the magnet 23 should be energized so as to hold the armature-lever in position, the finger 6 will be locked in alinement with the arm 2<sup>a</sup> of the bell-crank lever, so that if the motor be operated to shift the chain 8 the pin 7 will strike against the lower end of the finger 6 and shift the arm 2<sup>a</sup> of the bell-crank lever to the right, thereby lifting the signal-rod and clearing the signal. As the bell-crank lever is shifted to the right in the manner described, a pin or projection 25 on the finger 6 will be caused to engage a spring-hook 26, mounted on a bracket 27, projecting from the standard 4, so as to hold the bell-crank lever in its shifted position and the signal at "clear" until by a release of the finger, as hereinafter described, the signal is permitted to drop automatically to "danger." As the arm 2<sup>a</sup> is shifted to the right in the manner described, so that the pin 25 will engage the hook 26, the arm 2<sup>a</sup> will strike against and shift an arm 28, also mounted on the bracket 27, so as to force a spring 29 away from the spring 30, said springs forming a

part of the circuit of the electric motor and thereby break the circuit of said motor. If while the parts are in position to the right the circuit through the magnet 23 should be broken, the armature-lever 21 will drop, thereby effecting a disengagement of the spring-catch 20 from the pin 19 on the weighted arm 18. The weighted arm being thus freed will drop, raising the lug 17, so that it will strike against the horn 16 and so shift the arm 12 as to disengage the catch 11 from the toe 15. As the signal is weighted so as to have a strong bias to danger position the disengagement of the catch 11 and toe 15 will permit the finger to so turn on its pivot against the tension of the spring 9 as to move the pin 25 out of engagement with the hook 26, whereupon the signal will drop to danger position and the several parts of the mechanism will be shifted to the left, as shown in full lines in Figs. 1 and 2. If now the magnet 23 be again energized, the several parts of the mechanism will be locked in the positions shown in full lines in Figs. 1 and 2, so that the signal can be again cleared by closing the circuit through the electric motor.

In order to prevent any accidental shifting of the lever 2<sup>a</sup> from danger position, a hook 31 is pivotally mounted on the bracket 32, secured to the standard of the machine in such position as to drop into engagement with pin 25 as soon as the lever 2<sup>a</sup> has been shifted to danger position. In order to effect a release of the pin 25 when the chain 8 is shifted, a projection 33 is secured to the chain in the rear of the pin 7 and is so constructed as to bear against a cam projection 34 on the hook 31 and lift the latter prior to the engagement of the pin 7 with the lower end of the finger 6. The driving-chain 8 is arranged around sprocket-wheels 35 and 36, which are mounted in suitable bearings secured on the base-plate 5, and to the shaft of one of these wheels, as 35, is connected the armature-shaft of the electric motor. In order to take up any slack in the driving-chain, the shaft 37, on which the sprocket-wheel 36 loosely rotates, has secured to it eccentrics 38, mounted in oblong slots in standards 39. On the shaft 37 is secured an arm 39, whereby a partial rotation of the shaft 37 may be effected, so shifting by means of the eccentrics the shaft 37 as to move the sprocket-wheel toward or from the driving-wheel 35.

It will be observed that as the arm 2<sup>a</sup> moves from clear to danger position the weighted arm 18 or a projection therefrom will strike against the plate 24 and thereby lift the outer end of said arm as the bell-crank lever continues its movement to the left and so shift the lug 17 as to cause it to press down on the arm 17 and bring the catch 11 into the line of movement of the toe 15 of the finger 6.

It may sometimes happen that the magnet 23 will become deenergized just as the bell-crank lever is being shifted to clear the signal. In such case it is necessary that the

several devices should be unlocked, so as to permit the onward movement of the pin 7 without clearing the signal. In order to insure such a disengagement, a plate 40 is secured to the frame of the machine in such position that it will strike against the weighted arm 18 or a projection therefrom, provided said arm had been freed from the spring-catch 20 and is moved down sufficiently far to cause its lock 17 to bear against the horn 16. It might happen that the friction between the catch 11 and the toe 15 would be sufficient to prevent the weighted arm from effecting such disengagement except it had acquired a certain momentum in dropping. In case it should not acquire such momentum, if the magnet 23 was deenergized just as the arm 2<sup>a</sup> commenced to move the unlocking of the finger would be insured by the plate 40, which would prevent the weight from rising under the circumstances above mentioned.

The invention as specified in the claims is not limited to the exact construction and relative arrangement of parts described and shown, as many modifications and changes will readily suggest themselves to the skilled mechanic.

I claim herein as my invention--

1. In a signal apparatus, the combination of a signal having a bias to "danger," a pin moving in a circular or approximately circular path, a lever having one end connected to the signal, a finger movably mounted on the opposite end of the lever and projecting into the path of movement of the pin and a catch controlled by train movements for locking the finger in normal position, substantially as set forth.

2. In a signal apparatus, the combination of a signal having a bias to "danger," a pin moving in a circular or approximately circular path, a lever having one end connected to the signal, a finger movably mounted on the opposite end of the lever and projecting into the path of movement of the pin, a catch controlled by train movements for holding the finger in normal position and a means for engaging the finger and holding the signal in clear position, substantially as set forth.

3. In a signal apparatus, the combination of a signal having a bias to "danger," a pin moving in a circular or approximately circular path, a lever having one end connected to the signal, a finger movably mounted on the opposite end of the lever and projecting into the path of movement of the pin, an electrically-controlled mechanism for locking the finger in normal position, a hook for holding the lever in danger position, and means operative in advance of the pin for disengaging said hook, substantially as set forth.

In testimony whereof I have hereunto set my hand.

VIBE K. SPICER.

Witnesses:

DE WITT W. CHAMBERLIN,  
EDMUND T. BARNES.