

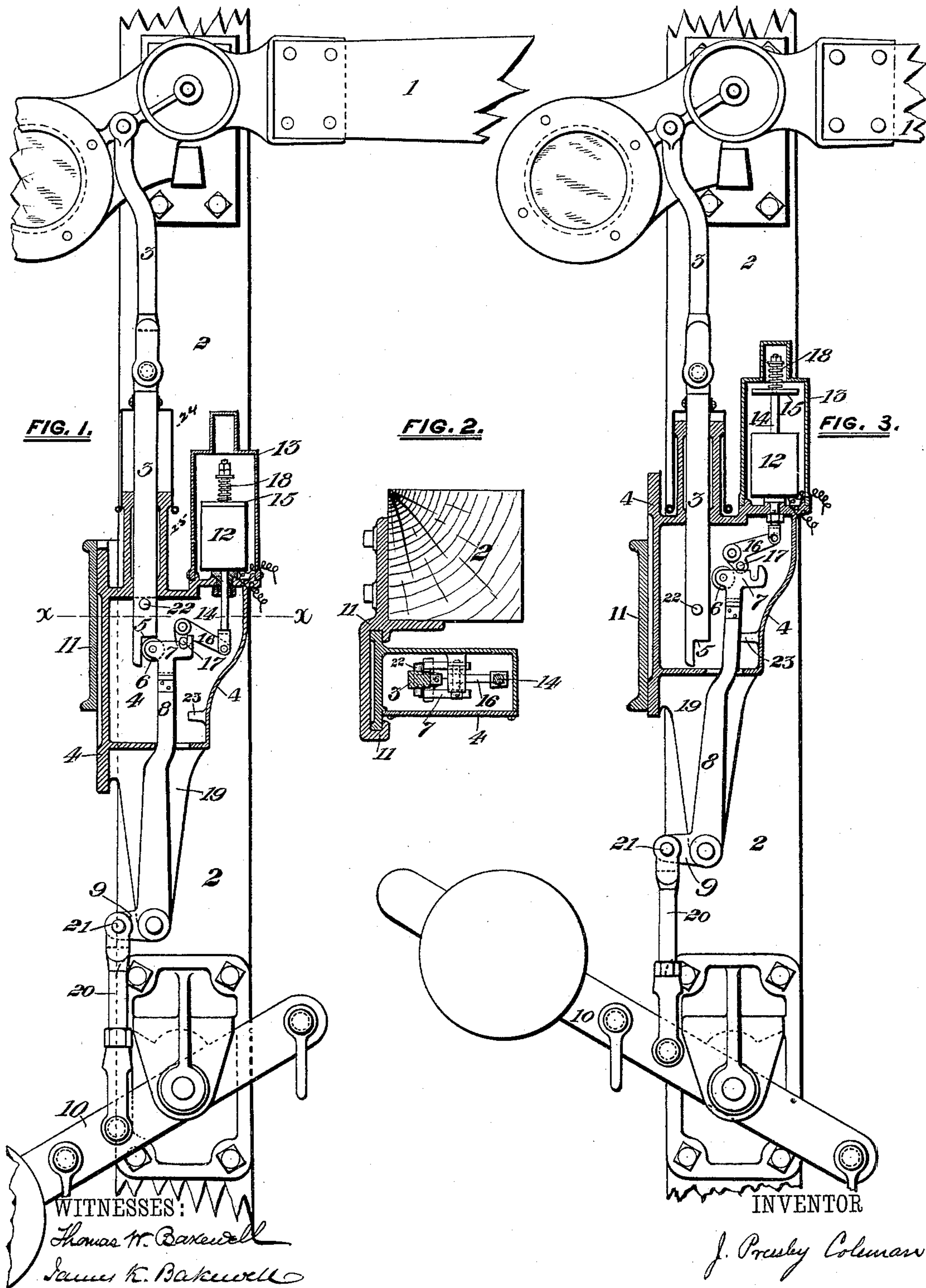
(No Model.)

J. P. COLEMAN.

ELECTRIC SIGNALING APPARATUS.

No. 395,315.

Patented Jan. 1, 1889.



UNITED STATES PATENT OFFICE.

JOHN PRESSLEY COLEMAN, OF SWISSVALE, PENNSYLVANIA.

ELECTRIC SIGNALING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 395,315, dated January 1, 1889.

Application filed March 10, 1888. Serial No. 266,805. (No model.)

To all whom it may concern:

Be it known that I, JOHN PRESSLEY COLEMAN, of Swissvale, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Electric Signaling Apparatus; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a sectional elevation of my improved device for operating a semaphore-signal, showing it as it is when the controlling electric circuit is closed or in its normal "safety" condition, but before the operative mechanism has been operated to shift the signal from its "danger" position (shown in the drawings) to the "safety" position. Fig. 3 is a similar view showing the parts in a different position and illustrating the parts when the connection between the semaphore and the operative mechanism is disjoined by break in the electric circuit. Fig. 2 is a horizontal cross-section on the line xx of Fig. 1.

Like symbols of reference indicate like parts in each.

My invention relates to an improvement in electrical apparatus for railroad-signals, commonly known as an "electrical slot," which consists of mechanism operated electrically from a distance, either automatically by action of a passing train or otherwise, so that when there is a break in the electric circuit in which the slot is included the parts are so moved that the semaphore is brought automatically into a "danger" position, and the connection with the mechanically-operating parts of the semaphore is disjoined, so that it cannot again be brought into a position of "safety" until the electric circuit is again established. This system of signaling is one which is well understood, and as my invention relates only to the apparatus constituting the slot it will not be necessary that I should further describe the system of which it forms a part.

The semaphore or other suitable signal, 1, is mounted in the usual manner on the post 2, the short or lantern end of which is weighted, so as to raise it into a horizontal position indicating "danger" when free to move. To

the short arm of the semaphore is connected the upright signal-operating rod, consisting of a rod, 3, which extends down beside the post into a box or frame, 4, its lower end having a recess, 5, adapted to engage a friction-roller, 6, which is mounted between the forked ends forming the head 7 of the bell-crank lever 8, which forms a continuation of the sectional operating-rod. This lever 8, whose upper end is arranged within the box or frame 4, is pivoted between lugs or hangers 19, which form part of the box or frame, and the short arm 9 of this lever is connected by a rod, 20, to the usual weighted lever, 10, which in turn is connected with a suitable operating-lever or other device.

In order to protect the box 4 from rain, which might otherwise find access to its interior, I provide the connecting-rod 3 with a hollow hood or cap, 24, which is fixed to the rod and works loosely over a projection, 25, of the box within which the rod passes.

The box or frame 4 is so mounted in ways 11 on the post 2 as to permit of its vertical movement, as will be hereinafter more fully described. On top of the box or frame 4, within a protecting-cap, 13, is set an electromagnet, 12, included in the electric circuit before mentioned. Through this magnet, which is preferably annular in construction, passes the rod 14, having at its upper end an armature, 15, and at its lower end extending down into the box 4 and connecting with the long arm of a bell-crank lever or trigger, 16, the short arm of which has a pin, 17, which is adapted to engage a notch in the head 7 in certain positions of the latter. The upper end of the rod 14 is reduced in diameter, thereby forming a shoulder for supporting the armature 15, located on the rod above the shoulder and held against it by a spring, 18, which surrounds the rod and bears at its upper end against a washer held in position by adjusting-nuts at the end of the rod. The function of this spring is to prevent the jar of the dropping of the weighted lever 10 injuring the armature. This it does by acting as a cushion between the armature and its seating on the magnets.

The operation of the device is as follows: Suppose the parts to be as shown in Fig. 1—

i. e., the electric circuit being completed, holding the armature 15 in contact with the magnets 12. The semaphore 1 is at "safety" and is supported by the friction-roller 6, being held
 5 in the recess 5 in the lower end of the rod 3 by the bell-crank lever 16, the pin 17 of that lever being in the notch in the head 7 of the lever 8, and the long arm of the bell-crank lever or trigger 16 being depressed by the attractive force of the magnets on the armature
 10 15. The position of the weighted lever 10 is also such that when the box or case 4, with its contained parts, is in its lowest position, the entire weight of the box 4 is supported by
 15 a stop, 22, on the rod 3, which engages with the case. If, now, the lever 10 be moved by the operator so as to raise the rod 20, the stress comes upon the pivot 21, which connects this rod with the arm 9 of the lever 8, and if it
 20 were not for the attractive force of the magnet 12 the lever 8 would be thrown over to the right, so as to disengage the roller 6 from the rod 3. As it is, however, the magnet acting on the armature, opposes this force and
 25 keeps the friction-roller in the notch 5, and hence the effect is to raise up not only the box 4, but the arm 3 as well, thus depressing the signal into the "safety" position. If, now, the circuit through the magnets 12 be broken
 30 from any cause the consequent demagnetization of the magnets 12, releasing the pull on the armature 15, causes the weight of the signal and the box 4, acting on the lever 8, to turn this lever to the right on the center 21
 35 until it comes into contact with a stop, 23, and thereby to disengage the head of the lever 8 from the rod 3 and to raise the trigger-lever 16. The rod 3 and the semaphore-signal are then unsupported, and the semaphore
 40 consequently rises to a horizontal "danger" position, while the rod 3 drops within the case 4. Any further motion of the lever 10 by the operator will not affect the rod 3 or the signal, but will simply act on the flanges 19 of
 45 the box 4 to raise this box loosely and to bring the parts into the position of Fig. 3. Suppose, now, that the electric circuit is closed by a train having passed off a track-section or otherwise. Then if the lever 10 be turned,
 50 so as to lower the box 4 and its contained parts, the lever 8 will descend with the box until the friction-roller 6 at the end of the lever comes opposite to the notch 5 at the lower end of the rod 3, when the lever will move to
 55 the left, so as to engage this roller in the notch 5 and to engage the notch on the head 7 of the lever 8 with the pin 17 of the trigger-lever 16, at the same time moving this trigger-lever so as to bring the armature 15 into
 60 contact with the excited magnet 12. The parts are then in the position shown in Fig. 1, and any motion of the lever 10 in the reverse direction will raise the rod 3 and will shift the signal to "safety," as will be readily
 65 understood.

As thus constructed the apparatus is of very great utility, because of its simplicity of con-

struction, cheapness, and ease of action. The compound arrangement of the levers is such that an electric circuit of comparatively little
 70 strength may be employed for holding the trigger 16 in position and resisting the displacement of the lever 8. The parts may, however, be greatly modified in form and location without departing from the principle
 75 of my invention, as expressed in the claims which form part of this specification.

Instead of the semaphore-signal which I show, the apparatus may be adapted to operate other forms of signal.

One of the distinguishing features of my invention is the use of the pivoted lever 8, which forms part of the operating mechanism of the signal, and which is movable on its pivot into and out of operative relation to
 85 the other connecting mechanism. The advantage of this construction over prior devices, wherein two sliding rods or plates are used for this purpose, is that I obtain a mechanism capable of great certainty of action and not
 90 liable to be injuriously affected by the action of rust or gum.

I claim—

1. In an apparatus for connecting a signal with its primary actuating mechanism, the
 95 combination, with the signal and its connecting-rod, of a pivoted lever which forms one of the mechanical connections between the signal and the actuating mechanism, said lever being movable on its pivot into and out
 100 of connection with the signal connecting-rod, and an electro-magnet which acts on the lever to hold it in connection with the said signal connecting-rod, substantially as and for the purposes described.

2. In an apparatus for connecting a signal with its primary actuating mechanism, the
 105 combination, with the signal and its connecting-rod, of a pivoted lever which forms one of the mechanical connections between the signal and the actuating mechanism, said lever being movable on its pivot into and out of connection with the signal connecting-rod, a trigger which engages the rod and holds the rod and lever in connection, and an electro-magnet which controls the trigger, substantially
 115 as and for the purposes described.

3. The combination of an electric circuit, a signal, a movable box or frame, a lever pivoted thereto and arranged to engage the
 120 signal-operating mechanism, a trigger controlled by an electro-magnet for holding the lever in operative relation with the signal, said lever being connected with the moving mechanism of the box or frame, which acts thereon against
 125 the force of the magnet and tends to disengage the lever from the signal, substantially as and for the purposes described.

4. In an apparatus for connecting a signal with its primary actuating mechanism, the
 130 combination, with the signal and its connecting-rod, of a pivoted lever which forms one of the mechanical connections between the signal and the actuating mechanism, said lever

being movable into and out of connection with the signal connecting-rod, an electro-magnet and its armature which acts on the lever to hold it in connection with the said signal connecting-rod, and a spring which bears on the armature, substantially as and for the purposes described.

5 In an apparatus for connecting a signal with its primary actuating mechanism, the combination, with the signal and its connecting-rod, of a rod or lever which is movable vertically to operate the signal, a box or case into which said rod or lever projects, said box or case being connected with the rod or lever

and moving with it in its motions to operate the signal, and a magnet and its armature which are inclosed by the box or case and which act on said rod or lever to hold it in operative connection with the signal connecting-rod, substantially as and for the purposes described.

In testimony whereof I have hereunto set my hand this 2d day of March, A. D. 1888.

JOHN PRESSLEY COLEMAN..

Witnesses:

W. B. CORWIN,

THOMAS W. BAKEWELL.