No. 881,301. PATENTED MAR. 10, 1908.

C. W. COLEMAN.

RAILWAY SIGNAL CHECK.

APPLICATION FILED JULY 18, 1907.

2 SHEETS—SHEET 1.

Fig. 1.

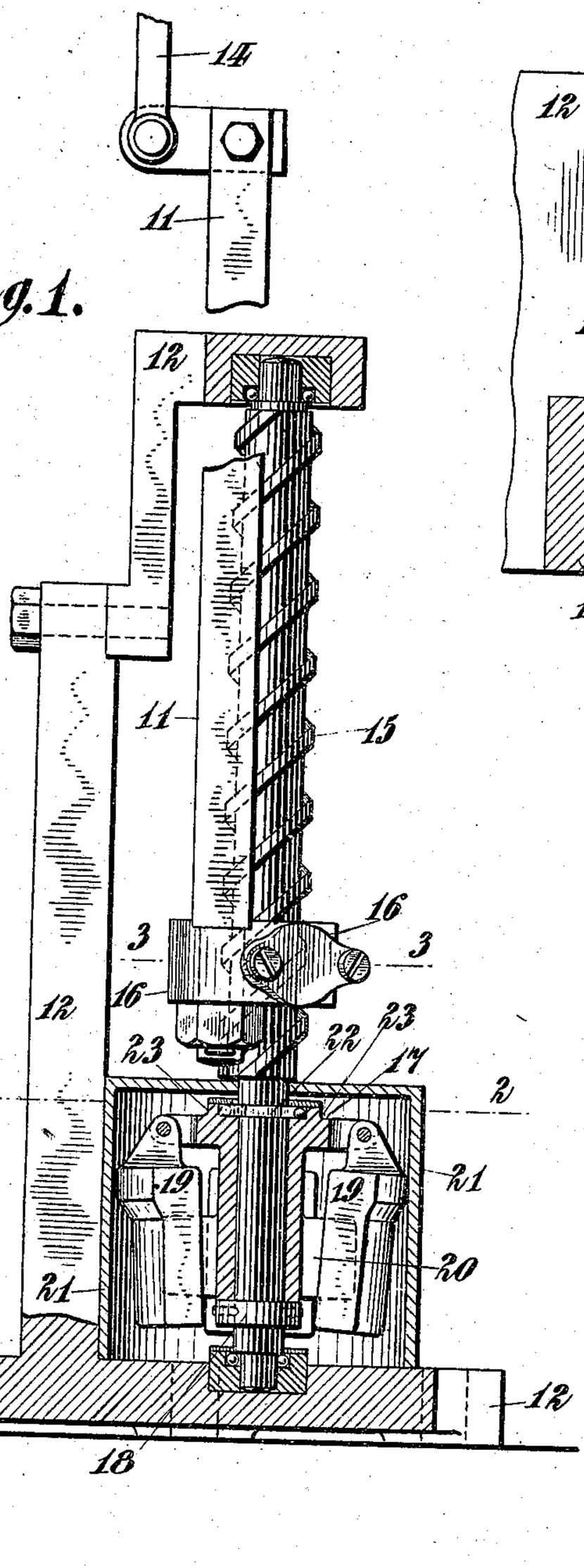


Fig. 2.

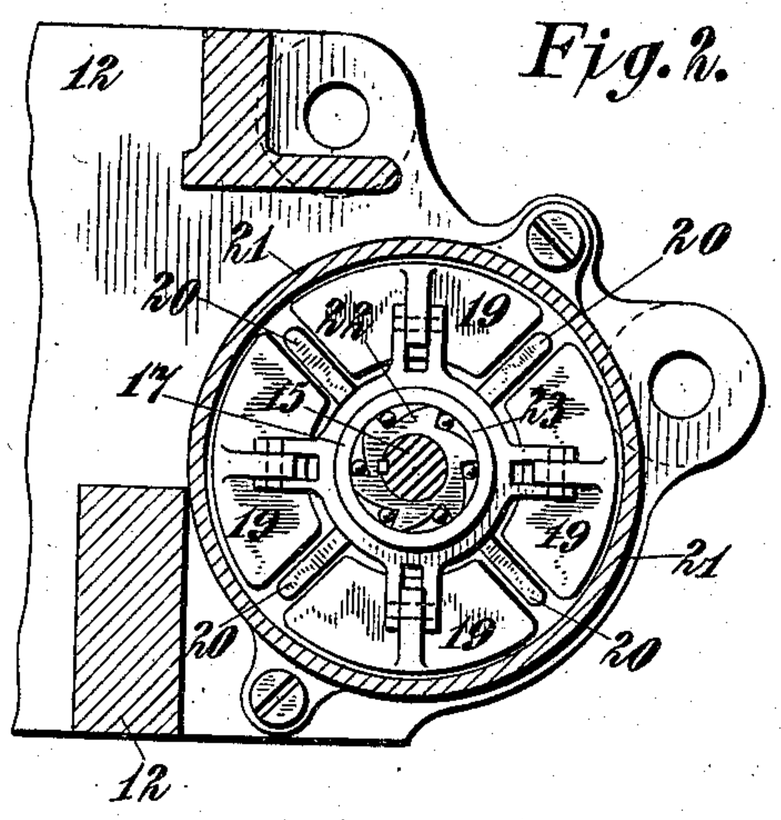
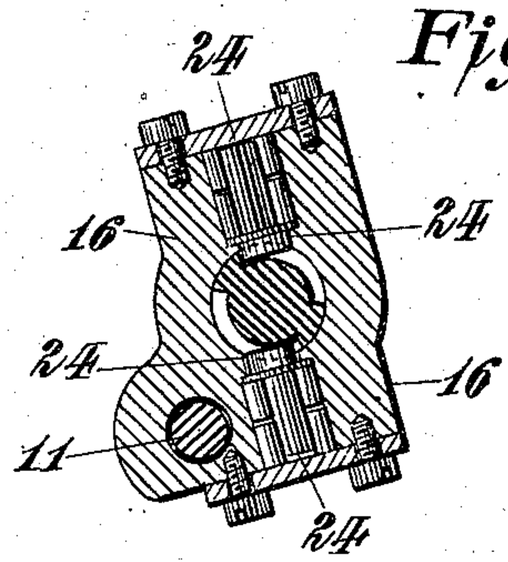


Fig. 3.



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2 SHEETS—SHEET 2.

Fig. 4.

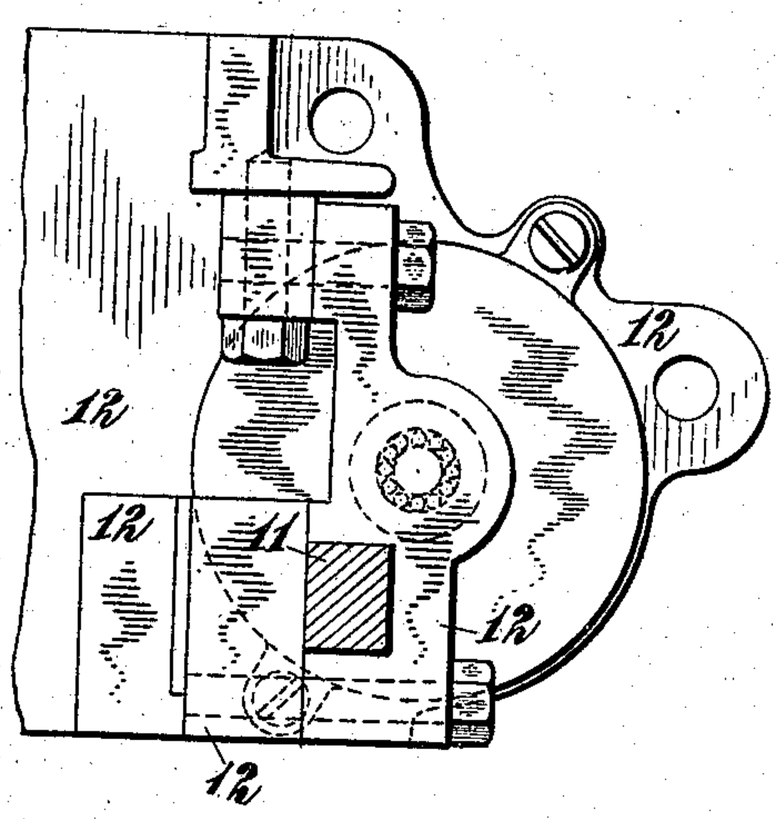


Fig. 5.

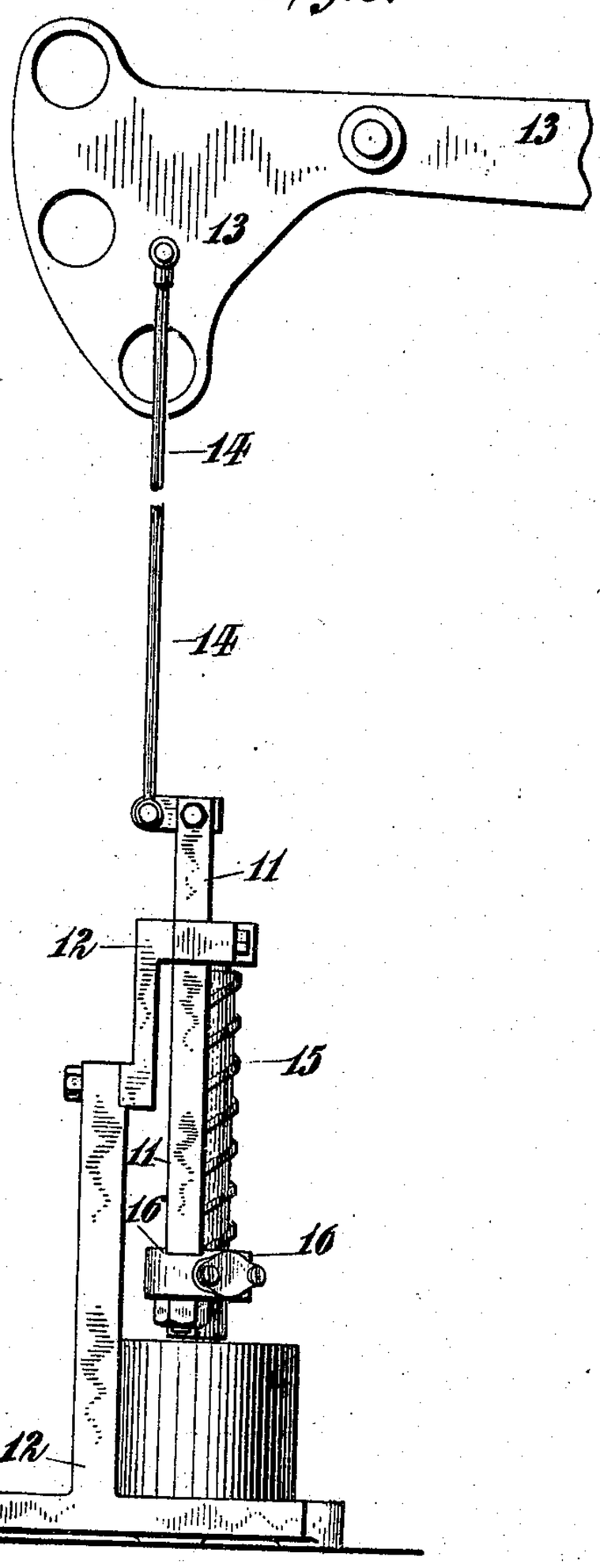
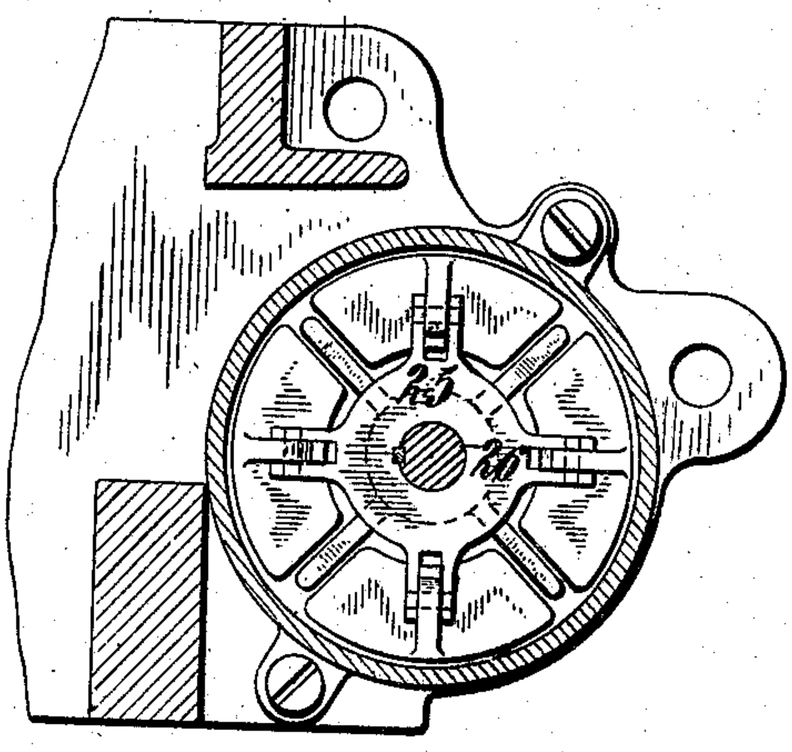


Fig. 6.



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UNITED STATES PATENT OFFICE.

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RAILWAY SIGNAL-CHECK.

No. 881,301. Specification of Letters Patent. Patented March 10, 1908.

Application filed July 18, 1907. Serial No. 384,337.

To all whom it may concern:

Be it known that I, CLARENCE W. COLEMAN, a citizen of the United States, residing at Westfield, in the county of Union and State of New Jersey, have invented a certain new and useful Improvement in Railway Signal-Checks, of which the following is a specification, reference being had therein to the accompanying drawings, forming part thereof.

My invention relates generally to railway signaling apparatus and particularly to devices for checking the too rapid movement of signals to the danger position, and the objects of my invention are efficiency of operation with simplicity of construction and economy of construction and maintenance.

Railway signals are commonly so constructed as to have a normal bias to the danger position so that when released they move of their own accord to the danger position, usually under the influence of gravity, and dashpots are commonly employed to prevent a too rapid movement such as might be damaging to the signaling mechanism. In my present invention dashpots are dispensed with and the checking is accomplished in a radically different manner.

My invention includes centrifugal means for checking the too rapid movement of a signal when moving under an impelling influence tending to produce rapid movement, as, for example, gravity.

My invention also includes means for rendering the centrifugal checking means inactive when the signal is moved by the signal clearing mechanism.

My invention also includes details of construction and combinations of parts as will appear from the following description.

In the embodiments of my invention illustrated in the accompanying drawings rotation is communicated to a centrifugal brake by a worm-shaft which is rotated by a sliding nut carried by the signal actuating rod. These embodiments of my invention will now be described, after which I will point out my invention in claims.

Figure 1 is an elevation partly in section of my improved signal check, a portion of the frame of the signal mechanism being broken away. Fig. 2 is a sectional plan on the line 2—2 of Fig. 1. Fig. 3 is a section through the worm-shaft and sliding nut on the line 3—3 of Fig. 1. Fig. 4 is a plan view with the thrust-rod or signal rod in section. Fig. 5 is an elevation on a reduced scale illustrating the practical application of my invention and showing a signal at the danger position, certain portions being broken away. Fig. 6 is a sectional plan similar to Fig. 2, showing a slightly modified construction.

A thrust rod or signal rod 11 is slidably supported in a frame 12, and is operatively connected with a signal or semaphore 13 by an up-and-down rod 14, the semaphore being shown in Fig. 5 as at the danger position. Movement may be communicated to the thrust-rod in any well known manner to move the signal to the safety position, or to an intermediate position, and to retain it in that position. Likewise any well known means may be employed to release the signal to permit it to assume the danger position, and the signal 13 illustrated would move to the danger position by reason of the weight of the spectacle end.

To prevent a too rapid and destructive movement of the signal to danger I provide a centrifugal signal checking device comprising a vertical worm-shaft 15, shown as supported at its ends in ball-bearings in the frame 12. A nut 16 is fixed upon the lower end of the thrust rod 11 and is adapted to travel or slide along the worm-shaft and to communicate rotary motion thereto, the nut 16 being held from rotation by the squared thrust-rod 11 and the frame 12. When the signal 13 moves a sliding or traveling movement is communicated to the nut 16 by the thrust-rod 11, and the worm-shaft 15 is rotated in one direction or the other according to the direction of linear motion of the thrust-rod 11.

As the signal is moved from the danger and toward the clear position, its rate of movement will be comparatively slow and the worm-shaft will accordingly rotate slowly. To prevent a too rapid movement of the signal as it moves to the danger position a centrifugal friction clutch or centrifugal braking device is provided for the worm-shaft 15, and preferably a directional clutch is provided to render the braking device inactive as the signal is moved from the danger toward the clear position. The centrifugal device includes a spider 17 shown as loosely rotatably mounted on a lower smooth portion of the worm-shaft 15, and is supported by a collar 18 fixed on the worm-shaft. The spider 17

has governor weights or centrifugal brake-shoes 19, shown as four in number, pivoted thereto so as to rotate therewith. The shoes or weights 19 are guided and assisted in their rotation by radial guide-wings 20 formed integral with the spider 17. The brake-shoes are adapted to coöperate with a cylindrical shell or casing 21 by which they are surrounded and inclosed. The brake-shoes have near their tops circumferential portions for frictional contact with the inside of the casing when in operation. The brake-shoes are reduced below the friction portions so as not to touch the casing, and these portions below the friction portions, by reason of their greater distances from the pivots, exert a leverage to produce greater friction at the friction portions. The pivots of the brake-shoes are so iocated in reference to their centers of gravity that when not in operation the brake-shoes will gravitate away from the inside of the casing or hang with their friction portions out of contact therewith, as may be seen in Fig. 1.

The means for rotating the governor weights or brake-shoes 19 comprise a ratchet-wheel or clutch-member 22 fixed on the worm-shaft 15, and a coöperating clutch-member shown as an annulus 23 formed integral with the spider 17, clutch-balls as shown being interposed between the two clutch-members and retained in place by a cover plate as may be seen in Fig. 1. These clutch members constitute a directional clutch or unidirectional connecting means between the worm-shaft 15 and spider 17, for imparting rotation to the spider 17 and weights 19 in one direction of rotation only of the worm-shaft. The spiral direction of the threads of the worm-shaft is such, relatively to the clutch, that rotary movement will be communicated to the weights 19 when the signal moves toward the danger position, corresponding, as shown in the drawings, to the downward movement of the thrust-rod 11 and its nut 16.

When the signal drops toward the danger position the worm-shaft 15 will be rotated rapidly enough to cause the weights 19 to impinge by centrifugal force against the casing 21 and so as to act as a brake to prevent a too rapid movement of the signal.

The directional clutch prevents any friction from centrifugal action when the signal is being moved to clear, the worm-shaft 15 then rotating freely, in the opposite direction, in the spider 17.

To reduce to a minimum the friction of the traveling nut 16 with the worm-shaft 17, the nut is provided with stud-rollers 24 which are mounted in roller bearings as shown. These stud-rollers engage the worm or thread of the worm-shaft. The worm thread is preferably double, as shown and may be of about one and one-half pitch.

Usually the movement of the signal to the clear position is not rapid enough to cause friction by throwing the weights 19 against the casing and in such cases the directional clutch may be omitted, as in the modified construction illustrated in Fig. 6, the construction in other respects being the same as just described. In Fig. 6 the spider 25 is shown as keyed on the worm-shaft 26.

It is obvious that various modifications may be made in the constructions shown and above particularly described within the principle and scope of my invention.

I claim:—

1. The combination of a signal, a signal actuating part, and a centrifugal friction clutch to check the movement of the signal.

2. The combination of a signal, a signal actuating part, and a centrifugal friction clutch connected to the signal actuating part.

3. The combination of a signal having a normal bias to danger, a signal actuating part for moving the signal to safety, and a centrifugal friction clutch to check the movement of the signal to danger.

4. The combination of a signal having a normal bias to danger, a signal actuating part for moving the signal to safety, and a centrifugal friction clutch to check the movement of the signal to danger, such clutch being connected to the signal actuating part.

5. The combination of a signal having a normal bias to danger, a signal actuating part for moving the signal to safety, a centrifugal friction clutch to check the movement of the signal to danger, and automatic means for rendering such clutch non-operative as the signal moves to safety.

6. The combination of a signal having a normal bias to danger, a signal actuating part for moving the signal to safety, a centrifugal friction clutch to check the movement of the signal to danger, such clutch being connected to the signal actuating part, and automatic means for operatively disconnecting such clutch from the signal actuating part when the signal moves toward safety.

7. The combination of a signal, a signal actuating part, a rectilinearly movable member connected to such part, a rotatable shaft, means for converting the rectilinear movement of said member to rotary movement of the shaft, and a centrifugal friction clutch to retard the rotation of the shaft.

8. The combination of a signal, a signal actuating part, a rectilinearly movable member connected to such part, a rotatable shaft, means for converting the rectilinear movement of said member to rotary movement of the shaft, a stationary friction part, and centrifugal weights carried by the shaft and adapted to make frictional contact with the stationary part when rotated at a predetermined speed.

9. The combination of a signal, a signal

actuating part, a rectilinearly vertically movable member connected to such part, a vertical worm-shaft, a non-rotative nut carried by the worm-shaft and engaging with the worm of the worm-shaft to rotate the worm-shaft, a cylindrical casing, a spider loosely rotatively mounted on the worm-shaft within the casing, a directional clutch to rotatively connect the worm-shaft with the spider in one direction of rotation only, and weights pivoted to the spider for radial swinging movement and so as normally to gravitate away from the casing and adapted to make frictional contact with the casing when rotated at a predetermined speed.

10. The combination of a signal, a signal actuating part, a frame, a vertically movable member rectilinearly and non-rotatively guided by the frame and connected to such part, a vertical worm-shaft having bearings in the frame, a non-rotative nut carried by said member and slidable on the worm-shaft, antifriction rollers carried by the nut and engaging with the worm of the worm-shaft to rotate the worm-shaft, a cylindrical casing, a spider loosely rotatively mounted on the worm-shaft within the casing, a directional clutch to rotatively connect the worm-shaft with the spider in one direction of rotation only, and weights pivoted to the spider for radial swinging movement and so as normally to gravitate away from the casing and adapted to make frictional contact with the casing when rotated at a predetermined speed.

11. The combination of a signal having a normal bias to danger, a signal actuating part for moving the signal to safety, a frame, a vertically movable member rectilinearly and non-rotatively guided by the frame and connected to such part, a vertical worm-shaft having bearings in the frame, a non-rotative nut carried by said member and slidable on the worm-shaft, antifriction rollers carried by the nut and engaging with the worm of the worm-shaft to rotate the worm-shaft, a cylindrical casing, a spider loosely mounted on the worm-shaft within the casing, a directional clutch to rotatively connect the worm-shaft with the spider in one direction of rotation only, corresponding with the movement of the signal to danger, and weights pivoted to the spider for radial swinging movement and so as normally to gravitate away from the casing and adapted to make frictional contact with the casing when rotated at a predetermined speed.

12. The combination of a signal having a normal bias to danger, a signal actuating part for moving the signal to safety, a frame, a vertically movable member rectilinearly and non-rotatively guided by the frame and connected to such part, a vertical worm-shaft having bearings in the frame, a non-rotative nut carried by said member and slidable on the worm-shaft, antifriction rollers carried by the nut and engaging with the worm of the worm-shaft to rotate the worm-shaft, a cylindrical casing, a spider loosely mounted on the worm-shaft within the casing, a directional clutch to rotatively connect the worm-shaft with the spider in one direction of rotation only, corresponding with the movement of the signal to danger, and weights pivoted to the spider for radial swinging movement and so as normally to gravitate away from the casing and adapted to make frictional contact with the casing when rotated at a predetermined speed, the spider being provided with radial guides for the weights.

In testimony whereof I affix my signature in presence of two witnesses.

CLARENCE W. COLEMAN.

Witnesses:
WM. ASHLEY KELLY,
BERNARD COWEN.