(No Model.) 2 Sheets—Sheet 1.

F. R. CLARKE.

MECHANISM FOR ACTUATING SIGNAL WIRES.

No. 338,389. Patented Mar. 23, 1886.

Fig. 2.

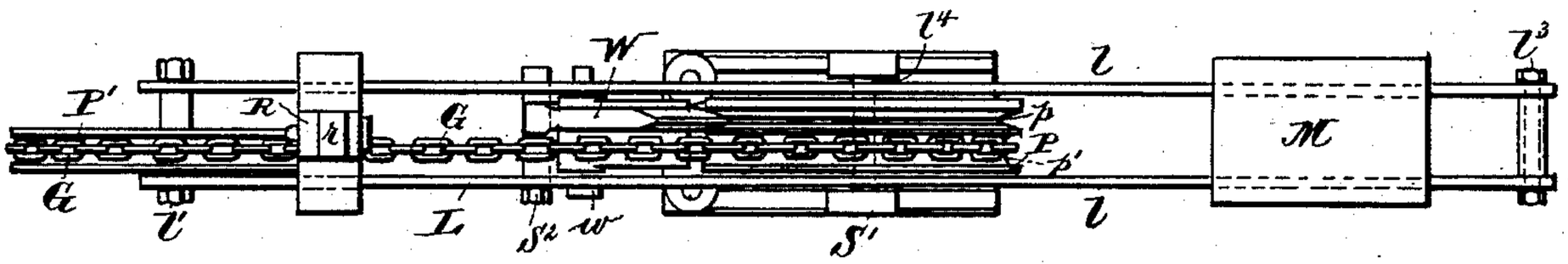
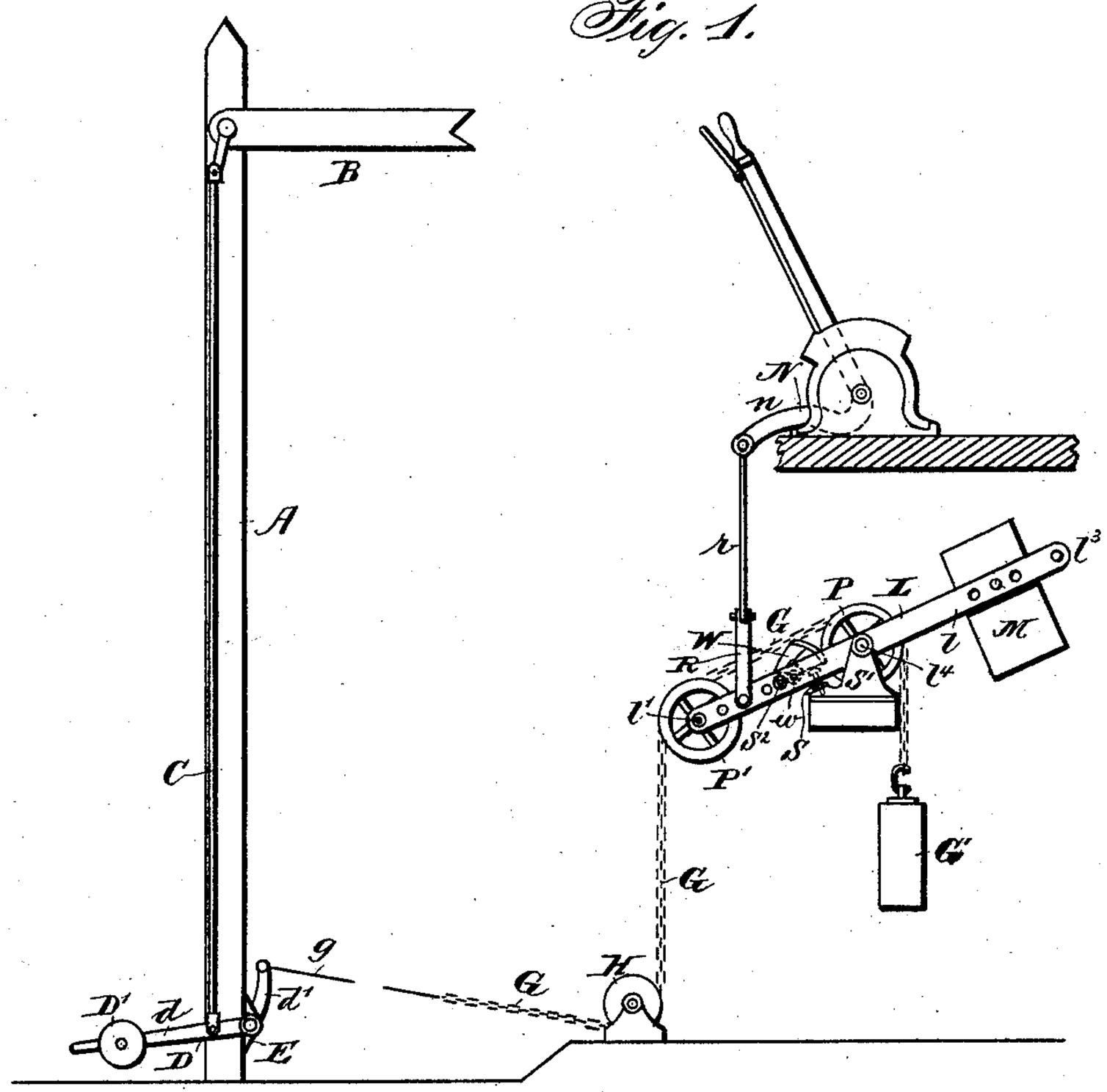


Fig. 1.



Witnesses:-
W. E. Baulter.
O. M. Knobloch.

Inventor:-
Francis R. Clarke,
per Henry Orth
his atty.

(No Model.) 2 Sheets—Sheet 2.

F. R. CLARKE.

MECHANISM FOR ACTUATING SIGNAL WIRES.

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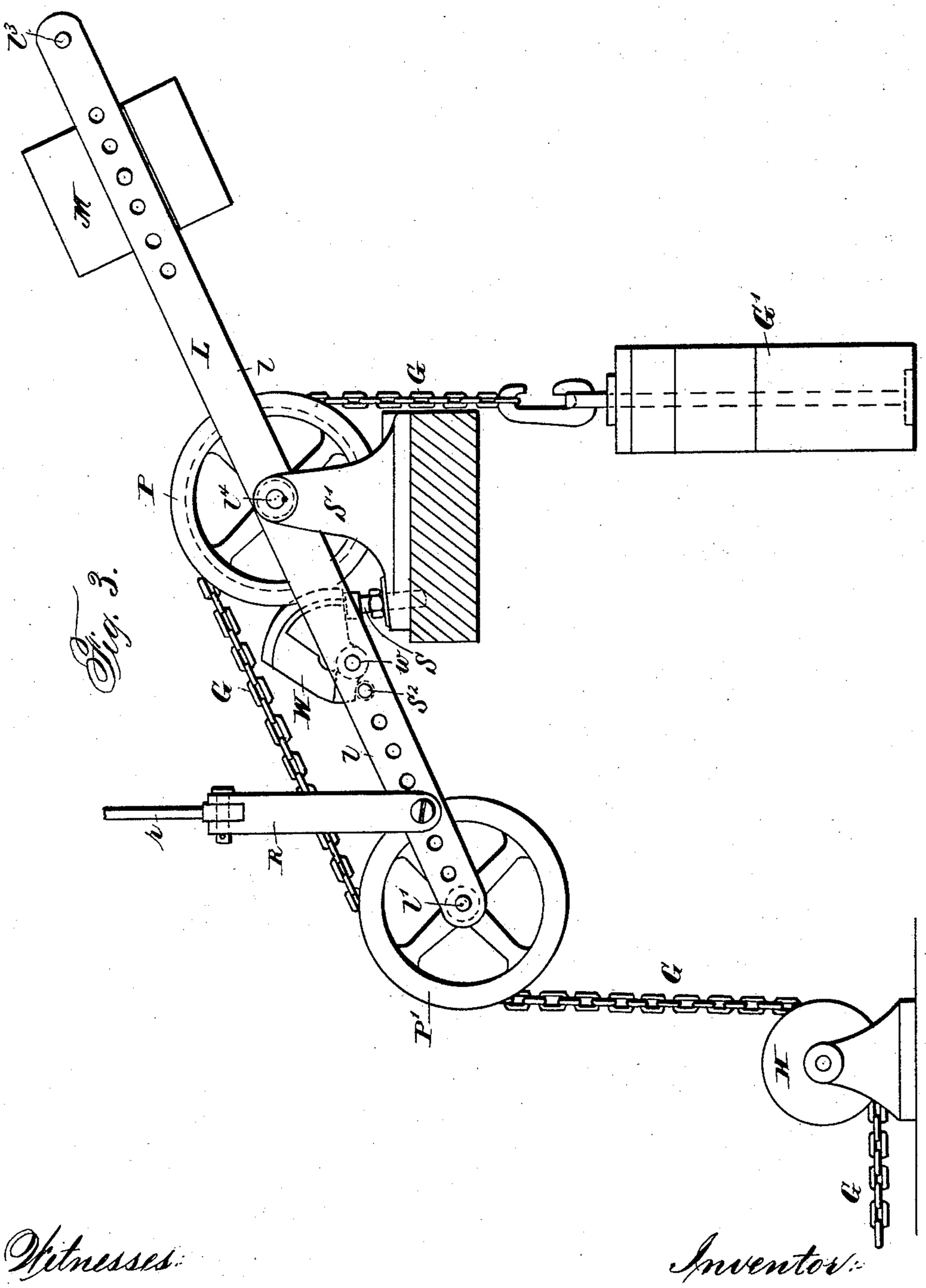

Fig. 3.

Witnesses:
W. E. Boulter.
O. M. Knobloch.

Inventor:
Francis R. Clarke,
per Henry Orth
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UNITED STATES PATENT OFFICE.

FRANCIS ROWLAND CLARKE, OF REDDISH, COUNTY OF LANCASTER, ENGLAND.

MECHANISM FOR ACTUATING SIGNAL-WIRES.

SPECIFICATION forming part of Letters Patent No. 338,389, dated March 23, 1886.

Application filed January 9, 1886. Serial No. 188,144. (No model.) Patented in England September 30, 1884, No. 12,960.

To all whom it may concern:

Be it known that I, FRANCIS ROWLAND CLARKE, a citizen of Great Britain, residing at Reddish, in the county of Lancaster and Kingdom of Great Britain, have invented certain new and useful Improvements in Mechanism for Actuating Signal-Wires, (for which I have obtained Letters Patent in Great Britain, No. 12,960, dated September 30, 1884;) and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

This invention relates to railroad-signals, and has for its object to provide means by which the connections between the signal and the operating-lever are allowed to expand and contract under varying atmospheric conditions, without either unduly straining the same or producing a slack therein.

The invention consists, essentially, in the arrangement and combination of devices hereinafter fully described, whereby the object of this invention is attained in a simple, efficient, and convenient manner.

Referring to the accompanying drawings, which form a part of this specification, Figure 1 is a side elevation of my improved arrangement of devices. Fig. 2 is a top plan view of the devices interposed between the signal and the operating-lever therefor; and Fig. 3 is a side elevation of the same, both being drawn on a larger scale.

In railroad-signals operated from a distance, in which metallic connections—such as a wire or wires—are used to connect the signal with its operating-lever, the extent of contraction and expansion in the connections will necessarily depend upon the length of such connections—that is to say, upon the distance of the operating-lever from the signal operated thereby. It has been found that when this distance is great, the contraction and expansion of the metallic connections is such as to produce under contraction a strain sufficient either to rupture the connections or to displace the signal when no intermediate locking devices to lock the signal against displacement are employed, or to produce on expansion such an amount of slack as to materially affect the operation of the signal. These difficulties and disadvantages are avoided by my improved mechanism for operating such signals and connecting the same with the operating-lever.

In the above drawings, A indicates a signal-post for railways, to which is pivoted a signal-arm, B, in the usual manner, so as to be brought on a line with the post, to indicate "safety"—that is to say, that the line is clear or at right angles to said post to indicate "danger"—that is to say, that the line is not clear. The signal is connected by means of a wire, C, to the long arm *d* of a two-armed lever, D, that is pivoted to a bracket, E, on the base of the post A.

On the end of the long arm *d* of the lever D is mounted an adjustable weight, D′, that maintains the connecting-wire C taut, but allows it to contract and expand under varying atmospheric conditions by yielding or following the "movement," if I may so term it, of the wire when it shortens or lengthens, thereby preventing either too great a strain or too great a slack in the connection. The short arm *d′* of the lever is curved and is connected to one end of a chain, G, or to such end by means of a wire, *g*. The chain G passes under a guide-pulley, H, and thence over a pulley, P′, loosely mounted on one end of a two-armed lever, L, pivoted in a bearing standard, S′, about midway of its length.

The lever L consists of a frame composed of two side bars, *l*, connected at its opposite ends by bolts *l′* S^2 l^3, the former bolt being a shouldered bolt, on which is loosely mounted the pulley *p′*, and the latter bolts having spacing-sleeves to properly space the side bars.

On the fulcrum 14 of the lever-frame L is loosely mounted a second pulley, P, which may have projections and recesses formed in a peripheral groove that fit the chain-links, or which may be an ordinary sprocket-wheel. The said pulley or wheel P has a wedge-shaped peripheral groove, *p*, by the side of the chain-groove *p′*, in which wedge or V shaped groove lies the corresponding face of a segmental wedge, W, that is pivoted eccentrically at *w*, between the side bars, *l*, of the lever L. This wedge acts as a brake to prevent the pulley

or wheel P from rotating independently of the lever L on its fulcrum 14, for purposes presently explained.

S is an adjustable stop secured to the base-plate of the standard S′, the head of which lies underneath the brake-wedge W, so that when the lever-frame L is in its normal position, holding the signal at "danger," as shown in the drawings, the brake-wedge is lifted by the stop S out of contact with the periphery of the pulley or wheel P.

To the other end of the chain G is attached a weight or weights, G′, to maintain the connections properly stretched, but yielding or following the movements thereof when they contract or expand, in a manner similar to that described in reference to the intermediate connection or lever, D, which the chain G, lever D, and wire C can readily do since the brake-wedge W is normally disengaged from the periphery of the wheel or pulley P, and the latter is therefore free to rotate on its axis or shaft, which is the lever-fulcrum 14, as above stated. When, however, the lever-frame L is oscillated so that its forward end will move away from the stop S, the brake-wedge W will at once act upon the periphery of the wheel or pulley P, and lock it against rotation, the wheel P′ pulling upon chain G and the short upwardly-curved arm of the lever D. The signal-arm B will be tilted out of its position and brought on a line with the signal-post A, or to "safety," as will be readily seen by an examination of the drawings.

On the outer or free end of the lever-frame L is mounted an adjustable counter-weight, M, to counterbalance the pulley P′ and connecting-chain G and its weight, so that the least pull upon the lever will set the signal-arm.

S^2 is a transverse bolt or pin, that not only assists in bracing the lever-frame L, but also acts as a stop to prevent the brake-wedge W from being thrown back too far, and thereby prevent its engagement with the pulley or wheel P. The forward end of the lever L or lever-frame L is connected by means of a forked rod, R, and a rod, *r*, pivoted to the upper end thereof, with the horizontal arm *n* of a bell-crank lever, N, by means of which the signal is operated, as plainly shown.

As shown in Fig. 1, the lever N is adjustably connected with and along the lever L, so that when it becomes necessary to adjust the counterbalance-weight the connections between the levers L N may be correspondingly adjusted for obvious purposes.

In practice I secure the bearing-standard S′ for the lever-frame to a beam or framing sunk in the ground, and place the supports for the operating-lever N on a platform above it at any required distance from the signal-post A, though it will be understood that the relative arrangement of these parts may be varied, as it will depend upon various conditions of use, the arrangement of the tracks, for instance, and other local conditions.

What I claim is—

1. Mechanism for operating railway-signals, which consists of a counterbalanced lever interposed in the signal-connections, carrying a loose pulley on its fulcrum, a signal-connection passing over said fulcrum-pulley, and a yielding tension device on the free end of said connection to maintain the same stretched and allow it to expand and contract, in combination with a brake operating to lock the pulley against rotation on the lever, and stops to throw the brake out of action when the lever assumes a given position, and limit the movement of said brake away from the pulley, substantially as and for the purpose specified.

2. The combination, substantially as herein described, with a counterbalanced lever carrying a loose guide-pulley at one end and a loose sprocket-wheel or chain-pulley on its fulcrum, a chain connected at one end with a signal, and at its other with a weight, and passing over the guide-pulley and fulcrum-pulley of the lever, of a brake operating automatically to lock the fulcrum-pulley against rotation when the lever is moved in one direction to operate the signal and to disengage said pulley when the lever moves in a reverse direction, for the purpose specified.

3. The combination, substantially as described, with a counterbalanced lever carrying at one end a loose guide-pulley and a loose chain-pulley or sprocket-wheel on its fulcrum, a chain connected at one end with a signal and passing over said pulleys, and an adjustable yielding tension device connected with the other end of said chain, of a brake to automatically lock the fulcrum-pulley against rotation, and stops to throw the brake out of operation and limit its movement when thrown out of operation, for the purpose specified.

4. The combination, substantially as herein described, with the chain G and its weight G′, and the lever-frame L, carrying pulleys P and P′, the pulley P having a wedge-shaped peripheral groove, *p*, by the side of the chain-groove, of the brake-wedge W and the stops S and S^2, for the purpose specified.

5. The combination, substantially as herein described, with the chain G, its weight G′, lever-frame L, adjustable weight M, the pulleys P P′, said pulley P having a wedge-shaped peripheral groove, *p*, and the brake-wedge W, of the lever N and its connections R and *r*, for the purpose specified.

6. The combination, substantially as herein described, with the signal-arm B and operating-wire C, of the counterbalanced lever D, chain G, its weight G′, the counterbalanced lever-frame L, pulleys P P′, brake-wedge W, and the lever N, said parts being arranged for co-operation, as described.

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

Witnesses: FRANCIS ROWLAND CLARKE.
PETER J. LIOSEY,
JAMES WOOD.