(No Model.) 2 Sheets—Sheet 1.

J. K. BYLER.

RAILWAY SIGNALING APPARATUS.

No. 491,798. Patented Feb. 14, 1893.

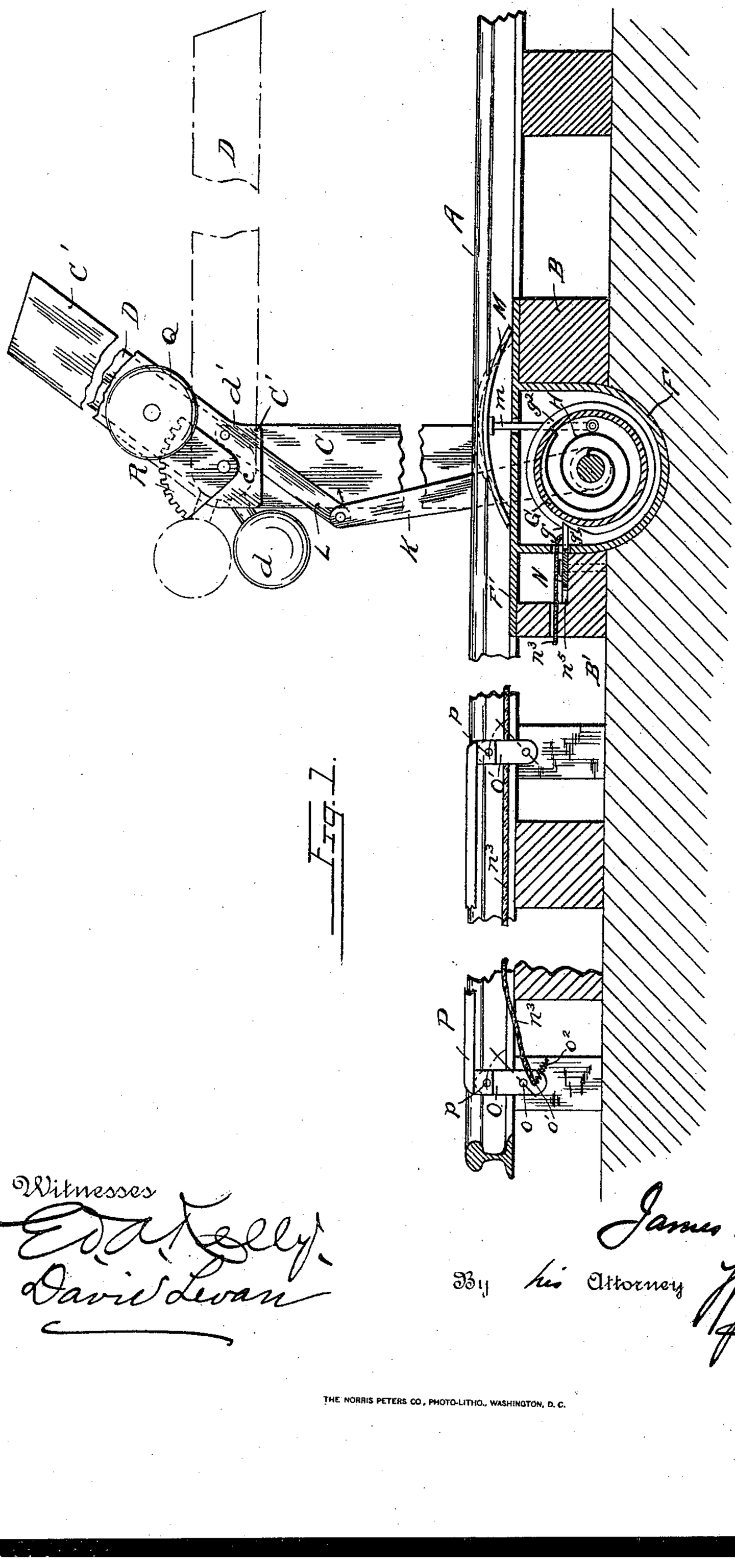

Fig. 1.

Witnesses
E. A. Kelly.
David Levan

Inventor
James K. Byler
By his Attorney
J. H. Whitlock

(No Model.) 2 Sheets—Sheet 2.

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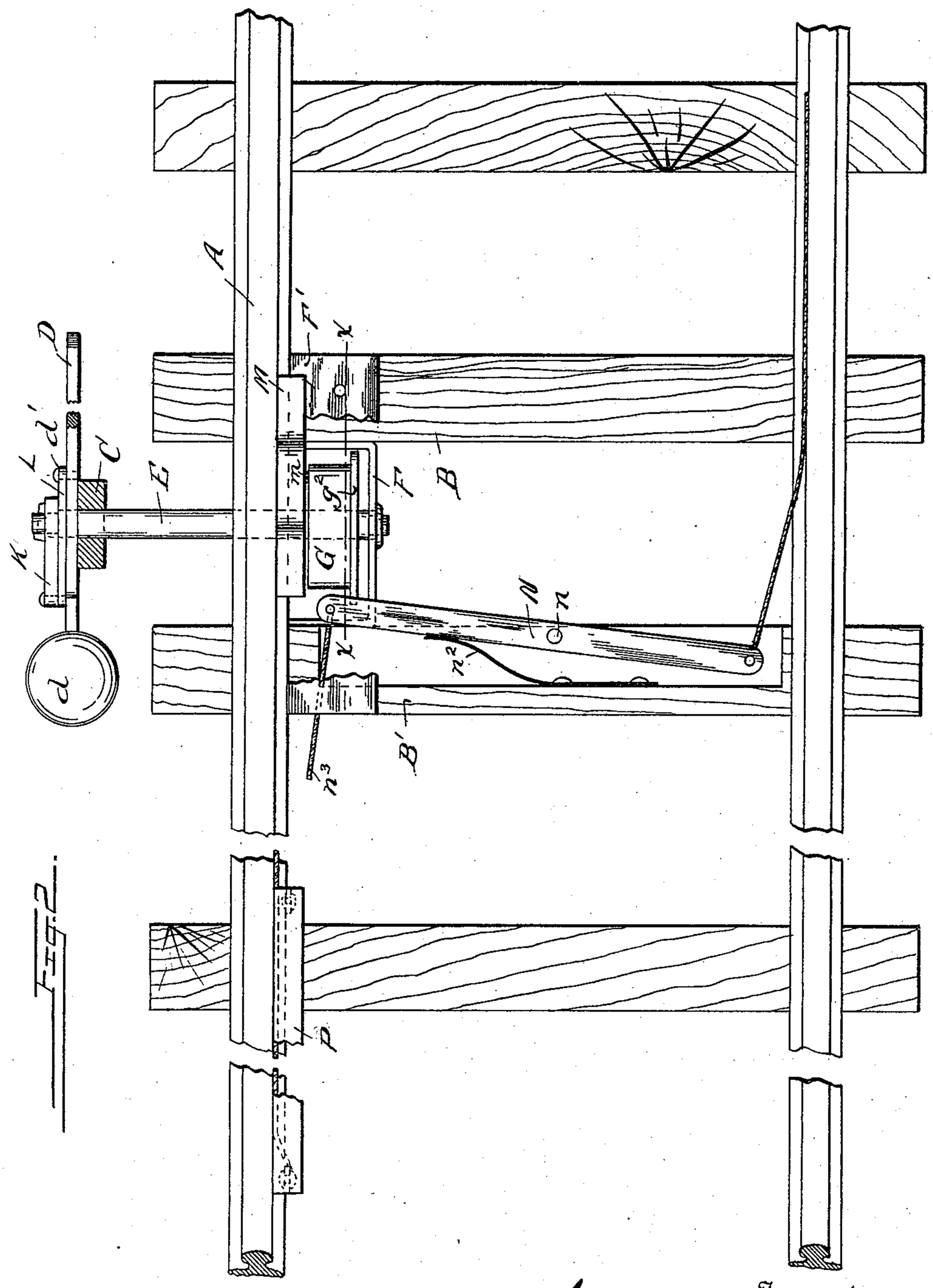

Fig. 2.

Witnesses
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UNITED STATES PATENT OFFICE.

JAMES K. BYLER, OF MORGANTOWN, PENNSYLVANIA.

RAILWAY SIGNALING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 491,798, dated February 14, 1893.

Application filed February 6, 1892. Serial No. 420,604. (No model.)

To all whom it may concern:

Be it known that I, JAMES K. BYLER, a citizen of the United States, residing at Morgantown, in the county of Berks, State of Pennsylvania, have invented certain Improvements in Railway Signaling Apparatus, of which the following is a specification.

This invention relates more particularly to that class of signals which are intended to prevent accidents at railroad crossings by giving timely and effective warning of approaching trains.

Heretofore safety gates have been designed for this purpose which were adapted to be operated automatically by moving trains. It is essential however to the usefulness of such automatic signals that their operation should be perfectly uniform regardless of the speed of the train which operates them, and that the mechanism should be so simple as to be always effective and reliable, and that it should at the same time be so economical as to make their extensive application practicable.

My object is to provide an apparatus which will meet all these requirements, and which will also be capable of adaptation to general railway signaling.

The important features are fully described in connection with the accompanying drawings and are specifically pointed out in the claims.

Figure 1 is a sectional elevation indicating the manner of applying my apparatus as an automatic railway safety gate; it is taken mainly on the line X X of Fig. 2. Fig. 2 is a plan view.

The post C, which carries the semaphore arm or gate D is secured in a vertical position at one side of the track and between two cross-ties B, B′, to which latter the rails A are fastened as usual. The semaphore arm D, which is pivoted to the post at a point *c*, is provided with a counterbalance weight *d* which however is not sufficient to prevent the arm D from falling normally to the horizontal position indicated by dotted lines. This arm may be protected by a fixed roof or covering C′ as indicated.

Mounted at its outer end in the lower portion of the post C is a horizontal shaft E which extends transversely under the rail A and is mounted at its opposite end in the wall of a box F secured between the cross-ties B B′. To the outer end of this shaft E is secured an arm K which is connected by a link L to a point *d′* of the semaphore arm in such manner that the rotation of the shaft E so as to move the end of the arm K in the direction indicated by the arrow will raise the arm D.

Loosely mounted upon the inner end of the shaft E, within the box F, is a cylindrical spring-casing G to the periphery of which the outer end of a spiral spring H is fastened while its inner end is secured to the shaft. A flange g^2 upon this spring-casing is provided with notches *g* and *g′* adapted to be engaged by a trigger lever N which is pivoted at a point *n*, in a horizontal transverse position, and is normally pressed into engagement with the notched flange g^2 by means of a spring n^5. The casing is connected by a rod *m* to a spring-plate M, which latter is arranged adjacent to the rail A so as to be depressed by a passing train. When thus depressed it winds up the spiral spring H slightly, thus tending to move the arm K in the direction of the arrow and raising and holding the semaphore arm D in its elevated position. This torsional strain on the shaft E, and depressed position of the spring plate M, is maintained by the trigger-lever N which normally engages one of the notches *g g′*.

To complete my apparatus it is only necessary to provide means for automatically operating the trigger-lever N. This may be accomplished by any well known means involving essentially a pivoted arm adapted to be operated by a moving train, and a wire or rod connection; I prefer however the special form shown in the drawings. The arm O which is pivoted at *o* to a fixed point, is connected at *o′* to the operating wire n^3, and supports at its upper end one end of a plate P running parallel with and adjacent to the rail the opposite end of which is carried by a pivoted arm O′ similar to O. This plate, which forms a narrow platform inside the rail, and is maintained normally on the same level by means of a spring o^2, is pivoted to the arms

O and O′ at points *p* so that when the platform-lever thus formed is depressed by a wheel flange bearing at any point of its length both arms O, O′ assume the inclined positions indicated by the dotted center lines, and the trigger-lever N is held in its retracted position; the platform-plate being made of sufficient length to insure its being pressed down by at least one wheel during the whole passage of a train. The spring-plate M which rides upon the cover plate F′ of the box F, is left in depressed position after the passage of a train and the semaphore arm is held up by the tension thus produced upon the shaft E. When another train arrives at the platform-lever P, which is located at any proper distance from the signal, the trigger-lever N is automatically drawn back, the spring H unwinds, the spring plate M rises to the dotted position, and the semaphore arm D, being relieved from the lifting influence previously conveyed to it through the arm K, falls to its normal horizontal position. When the train however gets to the spring plate M and again depresses it the spring H is again wound up and held by the trigger N, and the semaphore arm caused to rise.

A gong Q may be advantageously used with my apparatus and I prefer to apply it substantially as indicated in Fig. 1, in which the operating mechanism is inclosed by the bell itself,—the quadrant R, which is carried by the semaphore shaft *c* and gears with the gong mechanism so as to cause its long continued operation when the arm D falls, being the only other part that shows in such case. The arm D may be placed at any desired height and be made of any preferred length, depending upon the particular requirements or preference in each case. The spring mechanism through which the train operates to raise the arm renders the movement of the latter perfectly easy and uniform regardless of the speed of the train.

I do not however wish to limit myself to either the exact spring arrangement shown or to such other details of the construction shown and described as may obviously be modified without departing from the spirit of my invention, but:—

What I claim is:—

1. In a railway signaling apparatus the combination with the pivoted semaphore arm of the rotary shaft E extending transversely under a rail of the track and operatively connected with said arm, a casing loosely mounted on said shaft and connected therewith by a spring and means for automatically rotating the casing to produce a torsional strain upon the shaft, substantially as and for the purpose set forth.

2. In a railway signaling apparatus the combination with the pivoted semaphore arm of the rotary shaft E extending transversely under a rail of the track and operatively connected with said arm, a casing loosely mounted on said shaft and connected therewith by a spring, means for automatically rotating the casing to produce a torsional strain upon the shaft, and a trigger mechanism for locking said casing, substantially as set forth.

3. In a railway signaling apparatus the combination with the pivoted semaphore arm of the rotary shaft E extending transversely under a rail of the track and operatively connected with said arm, a casing loosely mounted on said shaft and connected therewith by a spring, means for automatically rotating the casing to produce a torsional strain upon the shaft, a trigger mechanism for locking said casing and means for automatically operating the trigger mechanism, all substantially as set forth.

4. In a railway signaling apparatus, the combination with the pivoted semaphore arm, and a rotary shaft operatively connected with said arm, and extending transversely under a rail of the track, of a casing loosely mounted on said shaft and connected therewith by a spring, a rod projecting from said casing and a spring plate engaging the upper end of said rod and adapted to be depressed by the wheels of a passing train, substantially as described and for the purposes specified.

5. In a railway signaling apparatus, the combination with the standard C, a semaphore arm pivoted thereto and having a weight at one end, a rotary shaft extending transversely under a rail of the track, and an arm K and link L, connecting said shaft and semaphore arm, of a casing loosely mounted on said shaft and connected therewith by a spring, a rod secured at its lower end to said casing, and a spring plate engaging the upper end of said rod and adapted to be depressed by the wheels of a passing train, substantially as described and for the purposes specified.

6. In a railway signaling apparatus, the combination with the standard C, a semaphore arm pivoted thereto and having a weight at one end, a rotary shaft extending transversely under a rail of the track, and an arm K and link L connecting said shaft and semaphore arm, of a casing loosely mounted on said shaft and connected therewith by a spring, said casing having notches on one side, a rod secured at its lower end to said casing near the side thereof, remote from said notches, a spring plate engaging the upper end of said rod and adapted to be depressed by the wheels of a passing train and thereby wind said spring in the casing, a pivoted trigger lever engaging said notches in the casing and serving to lock said casing, and means operated by a passing train for disengaging said trigger lever from the casing, as described.

7. In a railway signaling apparatus, the combination with the rotary shaft, and a semaphore arm connected with said shaft and provided with a weight adapted partly to bal-

ance it, of the spring secured at one end to said shaft and at the other end to a casing surrounding the same, a retracting plate connected to said casing and arranged adjacent to the track, and a trigger mechanism for holding said plate in depressed position, substantially as and for the purposes specified.

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

JAMES K. BYLER.

Witnesses:
ADAM L. OTTERBEIN,
C. F. EVANS.