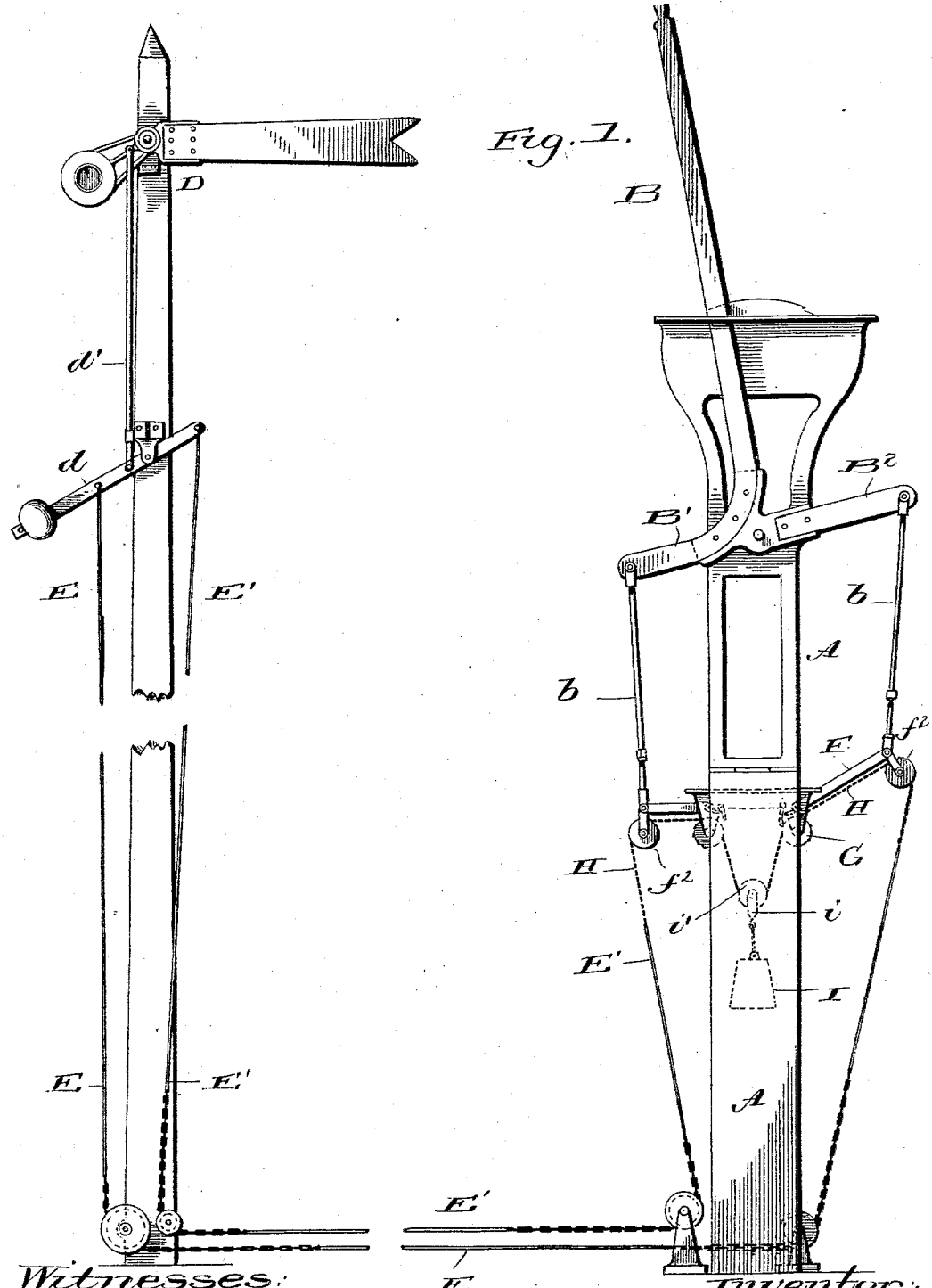
(No Model.) 2 Sheets—Sheet 1.

J. W. LATTIG.

COMPENSATING DEVICE FOR RAILWAY SIGNAL OPERATING APPARATUS.

No. 562,770. Patented June 23, 1896.



Witnesses:
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F. B. Keeler

Inventor:
Jacob W. Lattig,
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his Atty

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 2.

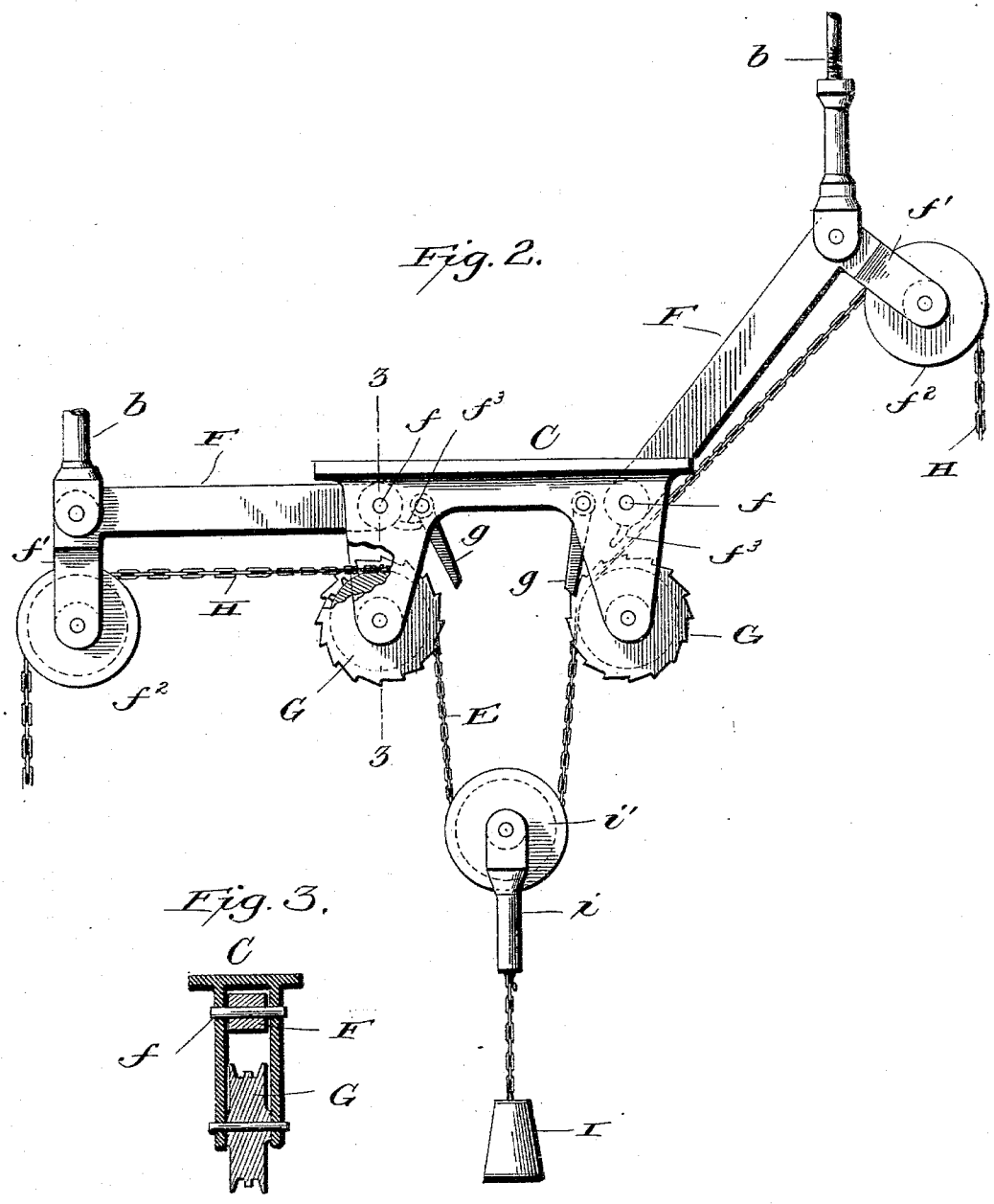

Fig. 3.

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UNITED STATES PATENT OFFICE.

JACOB WILLIAM LATTIG, OF SOUTH BETHLEHEM, PENNSYLVANIA.

COMPENSATING DEVICE FOR RAILWAY-SIGNAL-OPERATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 562,770, dated June 23, 1896.

Application filed October 7, 1895. Serial No. 564,925. (No model.)

To all whom it may concern:

Be it known that I, JACOB WILLIAM LATTIG, of South Bethlehem, in the county of Northampton and State of Pennsylvania, have invented a certain new and useful Improvement in Compensating Devices for Railway-Signal-Operating Apparatus and the Like, of which the following is a specification.

My invention has relation to devices for compensating for variations in the length of wire usually employed in manually-operated signal apparatus and which extends between and connects the signal with the operating-lever. It will first be described in connection with the accompanying drawings, and will then be more particularly pointed out in the claims.

Figure 1 is a side elevation of a signal and so much of an interlocking machine provided with my improvement connected to the signal as needed for the purpose of explanation. Fig. 2 is an elevation, on enlarged scale, of the compensator proper. Fig. 3 is a section on line 3 3, Fig. 2.

The apparatus shown in the drawings is one in which two wires are used between the signal and the operating-lever, the one to pull the signal to "danger," the other to pull it to "safety." The compensating device is intended to influence and control both wires, and is therefore termed a "double-wire compensator."

A is the stand of an interlocking machine.

B is the signal-operating lever.

C is the casting or frame (secured to the interlocking stand) which supports the parts of the compensator.

D is a semaphore-signal.

E E′ are the two wires or lines of wires leading over suitable guide-pulleys from the operating-stand to the signal-mast, where they connect with opposite arms of the centrally-pivoted counterweighted lever *d*, which is connected to the semaphore-blade in the usual way by a connecting-rod *d′*.

In the casting C and projecting from opposite sides or ends thereof are two levers F F, which I will term "compensating" levers. One end of each lever is pivoted at a point *f* to the casting C, and at its outer end is connected to the operating-lever B by a link or connecting-rod *b*. The operating-lever for this purpose is a double-crank or elbow lever pivoted at its elbow to the stand A, having one of its arms B′ connected to one compensating lever F and the other and oppositely-projecting arm B^2 connected to the other compensating lever F, the arrangement being such that when the operating-lever is at either extreme of its stroke one of the compensating levers will be lifted and the other will be turned down. The object of thus moving the two compensating levers is to lock or unlock, as the case may be, the compensating devices pertaining to the wires which the levers respectively pull on in order to operate the signal. This will be more fully explained presently.

Each lever at its outer end has a downward extension terminating in a forked or jawed piece *f′*, between the forks or jaws of which is journaled an ordinary grooved wheel f^2. For each compensating lever there is provided in the casting C a ratchet sprocket-wheel G, journaled in the casting at a point adjoining the inner end of its compensating lever; and upon the casting is pivoted a pawl *g* for each wheel G, which normally engages the ratchet of said wheel and prevents it from turning in a direction to give slack to the wire to which it pertains.

The two wires E E′ are joined at the operating end by a sprocket-chain H, which leads from one wire to the other over the two sets of wheels f^2 and G of the compensating levers, engaging on its way each sprocket-wheel.

At a point between the two compensating levers is the compensating weight I, which is hung from a jawed arm *i*, pivoted on the axle of the grooved wheel *i′*, which rests on the sprocket-chain. Under this arrangement it will be seen that the weight is drawing constantly on the sprocket-chain in a direction to take up slack and to hold taut both of the wires E E′, when permitted so to do by the pawls *g*. These pawls, however, so long as they engage the sprocket-wheels G, prevent their revolution in the direction of the pull for influencing the signal, and consequently prevent the compensating weight from influencing or giving up slack to the wire at this time. The pawls, however, are at stated periods disengaged from their ratchets, so as to permit compensation to take place. The

means employed for this purpose are as follows: On the inner end of each compensating lever there is a finger or projection f^3, which when the lever is down (or in other words is not pulling on its wire for the purpose of influencing the signal) meets the pawl pertaining to it and lifts it from the ratchet of its sprocket-wheel, thus releasing the latter and permitting it to revolve freely in both directions. The arrangement is such that the tripping of the pawl will not take place until very nearly the completion of the stroke of the operating-lever; and when the one sprocket-wheel is locked against rotation the other is released. This is illustrated in Fig. 1, wherein the signal is at "danger," and is there held by the wire E, even if the semaphore-blade and the lever d be not counterweighted, so as to tend to normally bring the blade to that position. In this position the sprocket-wheel of the compensating lever pertaining to wire E is locked against rotation, so that the operating-lever has a straight pull upon an unyielding wire. On the other hand the sprocket-wheel of the other wire, E′, (which latter is now idle,) is unlocked and free to revolve in either direction, thus permitting complete compensation of wire E′ to take place. At the same time, if the signal is to be brought to "safety," then the moment the operating-lever begins its movement, the finger f^3 of the compensating lever pertaining to wire E′ is instantly removed from the pawl which it controls, thus permitting the latter to engage again its sprocket-wheel and consequently locking said wheel against movement which will give slack to wire E′. Thus the operating-lever at once exerts a pull upon the signal through the thoroughly compensated wire E′. When the operating-lever completes its throw in a direction to put the signal to "safety," the compensating devices of the wire E will in turn be free to act. Thus each wire alternately is compensated, the compensating device in each case being outside of the line of wire and there being direct and positive connection between the operating-lever and the wire (to the exclusion of the compensating means) each time that wire is called into action.

The power by which compensation is effected is a weight in the apparatus, as I have illustrated it; but I may substitute a spring for a weight, and in case of a horizontal arrangement of the compensator, instead of a vertical arrangement, such as shown, I should prefer to use the spring.

It will be noted that, in the apparatus as I have illustrated it, should either of the wires break when exerting pull on the signal, the signal, if at "safety," would at once go to "danger," or if already at "danger" would so remain.

In case a single wire were used—as, for example, only one wire E′ to pull the signal to "safety," relying on counterweighting of the signal and its lever d to induce movement of the signal in the other direction—then the wire E and its compensating devices could be dispensed with and the compensating weight could hang from the end of a sprocket-chain attached to the wire E′ alone.

What I claim herein, and desire to secure by Letters Patent, is—

1. The combination with the operating-lever and the signal, of the ratchet sprocket-wheel and the signal-controlling chain, a weight or its specified equivalent to influence said chain, the pawl normally engaging said ratchet sprocket-wheel, and the compensating lever, provided with a heel or projection to positively lift the pawl out of engagement with the ratchet sprocket-wheel, at the time and in the manner set forth.

2. The combination of the operating-lever; the signal; the two line-wires; the two compensating levers pivoted to the stand at their inner opposite ends; the ratchet sprocket-wheels one for each compensating lever journaled in the stand and located at the inner end of their respective levers; the controlling-pawls for said wheels; the sprocket-chain extending between and connecting the line-wires and passing over the sprocket-wheels and thence over guides at the outer ends of the compensating levers; the weight or its specified equivalent; and means carried by the compensating levers for automatically tripping or lifting the pawls out of engagement with their sprocket-wheels at the times and in the manner set forth.

3. The combination with the stand and the operating-lever, of the compensating lever F pivoted at one end to the stand, and connected at the other end to the operating-lever by the link b; the antifriction-wheel f^2 at the free end of the lever; the ratchet sprocket-wheel G pivoted to the stand at a point adjoining the axis of motion of the compensating lever; the sprocket-chain H and line-wire; the weight or its equivalent attached to the free end of the sprocket-chain; the pawl g; and means for disengaging the pawl from the ratchet sprocket-wheel, whenever and so long as the line-wire is out of action, as hereinbefore shown and described.

In testimony whereof I have hereunto set my hand this 4th day of October, 1895.

J. WILLIAM LATTIG.

Witnesses:

EDWARD J. MALLOY,

J. DAVIS BRODHEAD.