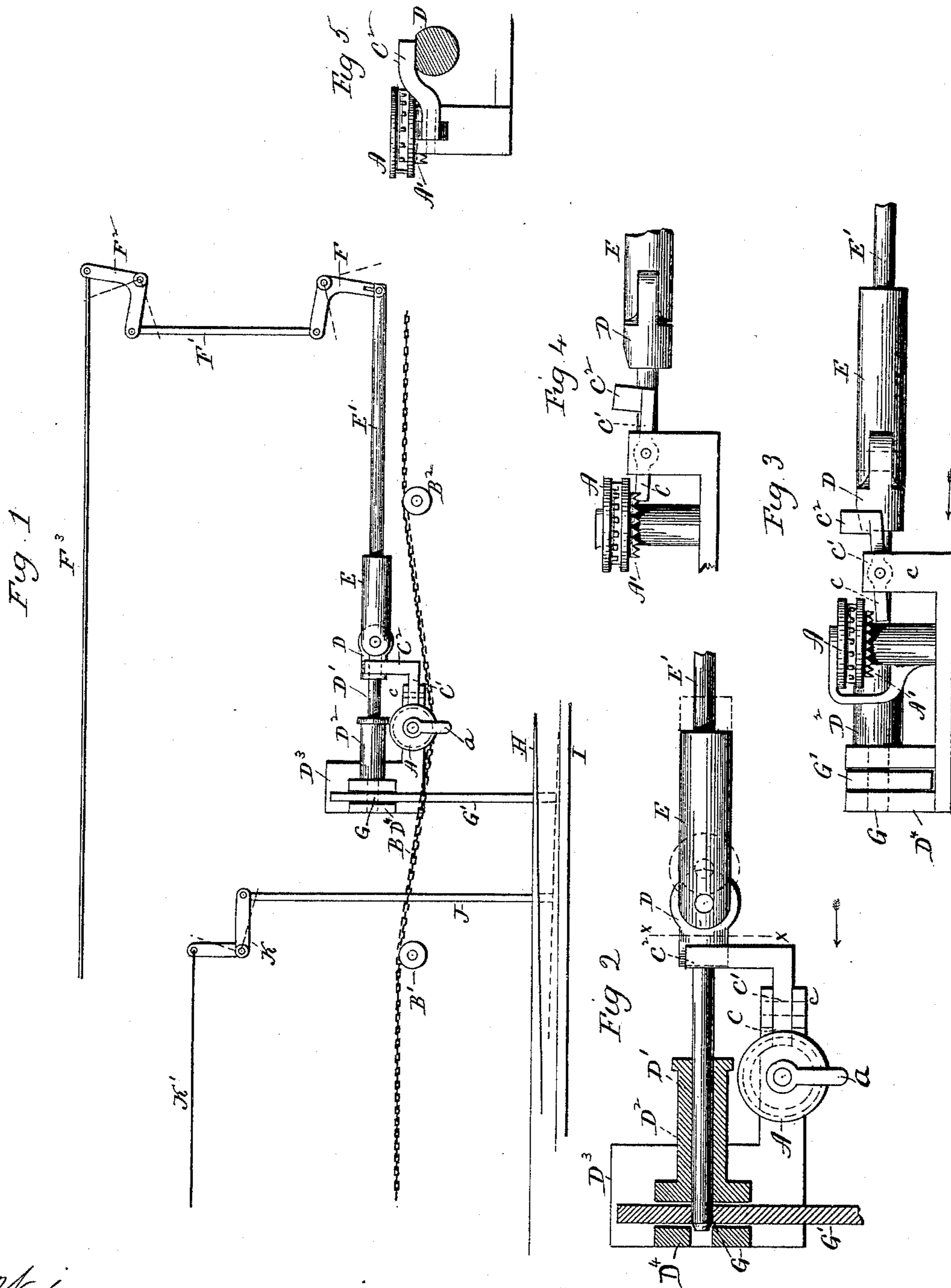


(No Model.)

F. N. KELSEY.
RAILWAY SIGNAL.

No. 491,754.

Patented Feb. 14, 1893.



Witnesses,
J. H. Shumway,
H. B. Cole.

Frank N. Kelsey
Inventor
By Atty
Eable & Symour

UNITED STATES PATENT OFFICE.

FRANK N. KELSEY, OF NEW HAVEN, CONNECTICUT.

RAILWAY-SIGNAL.

SPECIFICATION forming part of Letters Patent No. 491,754, dated February 14, 1893.

Application filed July 18, 1892. Serial No. 440,346. (No model.)

To all whom it may concern:

Be it known that I, FRANK N. KELSEY, of New Haven, in the county of New Haven and State of Connecticut, have invented a new Improvement in Railway-Signals; and I do hereby declare the following, when taken in connection with accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a plan view of a railway signal embodying my invention. Fig. 2 is a view on a larger scale partly in plan and partly in section and showing the locking connections of the switch and the switch-detector. Fig. 3 is a view inside elevation of the same parts, showing the sprocket-wheel unlocked. Fig. 4 is a similar but less comprehensive view to show the positions of the parts when the said wheel is locked. Fig. 5 is a view in transverse section on the line $x-x$ of Fig. 2 and showing the tail of the pawl in its relation to the beveled head of the plunger.

My invention relates to an improvement in railway signals of that class in which a switch-detector is virtually interposed between the switch and semaphore mechanisms, so that the latter cannot be operated unless the former are in perfect operative condition, and whereby the operator has timely information of any defect in the apparatus. As heretofore made the switch-detectors of signals of this class have been normally coupled with the locking connections of the switch mechanisms, so that the latter have been subject to the contractions and expansions of the operating connections of the semaphore mechanisms, thus entailing wear and strain on the said locking connections and on the detectors, and requiring frequent attention to the entire apparatus.

The object of my present invention is to produce a simple durable, and reliable apparatus in which the switch detector will normally be disconnected from the connections of the switch lock, and only coupled therewith when the same is unlocked.

With these ends in view, my invention consists in the combination with the switch and semaphore mechanisms of a railway signal,

of a switch-detector comprising a sprocket or chain-wheel which is engaged by the operating connections of the semaphore mechanism, and has face teeth, and a locking pawl adapted at one end to engage with the said teeth, and at its other end to be engaged for positive operation by a moving part of the locking mechanism of the switch-connections, whereby when the switch is locked the pawl is disconnected from the said wheel which is then free to turn, but when the switch is unlocked the pawl locks the wheel.

My invention further consists in certain details of construction and combinations of parts as will be hereinafter described and pointed out in the claims.

As herein shown, my improved switch-detector comprises a sprocket-wheel A, which is meshed into by a chain B, of suitable construction, forming a part of the operating-connection between the tower, which is not shown, and the semaphore, which, also, is not shown. The said chain is held to its place upon the sprocket wheel a strap a extending under the same from its center and by two sheaves B' B², of ordinary form. Beyond these sheaves the said connection may be composed of an extension of the said chain, or of rods or wire, or anything else suitable in that place. The said sprocket-wheel A, is provided upon its inner face with face teeth A', which are engaged by the inner end C, of a locking pawl C', the opposite or tail end of which is bent inward at a right angle, as at C², to be engaged by a beveled head D, formed at the outer end of the plunger D', which is mounted for horizontal movement in a plunger stand D², forming a part of a bearing-frame D³. When the inner end C, of the said pawl which swings on a pivot c , is engaged with the face teeth A' of the sprocket-wheel, the same is locked against being turned, whereby the operating connection including the chain B, is locked against longitudinal movement, preventing the operation of the semaphore. When, on the other hand, the beveled head D, of the plunger is moved toward the pawl, it lifts the tail thereof, and disconnects its opposite end from the wheel, which is then free to turn in either direction when the operative connection between the tower and semaphore

is operated regularly, or when it is expanded and contracted under the action of heat and cold. The said head D, is joined to a coupling E, mounted on the plunger rod E', which is
 5 connected at its outer end with a bell-crank lever F, in turn joined by a rod F', with a corresponding bell-crank lever F², which is connected with the tower connection F³. The extreme inner end of the plunger is slightly
 10 beveled, and thus adapted to be readily shot through a hole G, formed to receive it in the stretcher-bar G', which is guided back and forth between two upright guides D⁴ D⁴, formed upon the bearing frame D³. The op-
 15 posite end of the said stretcher-bar is connected with the split switch H, which co-operates with a track I, of the main line. The said bar and split switch are operated by means of a throw-rod J, fastened to the said
 20 switch, and connected at its opposite end to a bell-crank lever K, one arm of which has a tower-connection K'. The stretcher-bar and plunger form the essential elements of the locking connection of the switch mechanism.
 25 When, under the above described construction, the switch is set to leave the main track free, the plunger will be shot through the perforation in the stretcher-bar, at which time the beveled head D' will be so moved under
 30 the tail C² of the locking-pawl C', that the inner end C, thereof will be disengaged from the face teeth A' of the wheel A, so that the same will be free to be turned either by any longitudinal movement of the operating con-
 35 nection between the tower and semaphore, whether due to the action of an operator at the tower, or to the action of heat and cold. When, on the other hand, the beveled head D is moved away from the wheel A, the weight
 40 of the end or tail C² of the pawl will promptly operate the same in engaging its inner end C, with the face teeth A' of the wheel, which will thus be locked against rotation, and any movement of the operating connection be-
 45 tween the tower and semaphore prevented. It will be observed that when the locking connection is locked, the switch-detector is virtually cut out of use, but on the other hand that just as soon as the locking connection
 50 is unlocked, or fails to work, the detector is brought into operation.

One example of the safety action of the switch-detector would be to refuse to permit the semaphore to be operated to give a clear
 55 signal after the operator in the tower had failed to lock the switch owing to some breakage or derangement in the operating connections of the locking mechanism of the switch, but not known to him, the operator, for it is
 60 easily conceivable that the said connections might move and apparently work all right to him, without in fact discharging their duty properly.

The foregoing example assumes that the
 65 signal is set at "Danger," which is its normal position. Again, to give another exam-

ple, if the operating-connections should break while the switch is being unlocked, it would be impossible to clear the signal, for the reason that the pawl is engaged with the sprocket-wheel to lock the same, and hence also the
 70 signal, before the plunger is withdrawn from the stretcher-bar to unlock the said bar, so that the switch remains locked as well as the signal which is held fast by the sprocket-
 75 wheel and pawl.

I should mention that the pawl is released for locking the sprocket-wheel by the first portion of the outward movement of the plunger and before the same has actually unlocked
 80 the stretcher-bar, so that no partial or incomplete movement of the plunger can take place and leave the said wheel unlocked, and that similarly the pawl is raised to release
 85 the sprocket-wheel only by the final inward movement of the plunger, so that no shifting of the signal to safety can be given until the switch is completely shifted and locked.

I would have it understood that in carrying out my invention I do not limit myself to
 90 the particular locking connections and switch mechanism shown herein, but hold myself at liberty to make such changes and alterations therein as fairly fall within the spirit and
 95 scope of my invention.

Ordinarily, my improved switch-detector will be used in conjunction with an ordinary detector-bar located beside the track, and connected with the switch-point, and too well
 100 understood by those familiar with this art, to need detailed description or illustration here. But my device is not confined to use with a detector-bar, as, for instance, it might be used without the same in yard work, or in
 105 derailed switches, or in other situations where detector-bars are dispensed with in railroad work.

Having fully described my invention what I claim as new and desire to secure by Letters
 110 Patent is:—

1. In a railway signal, the combination with the locking connections of the switch and the operating connections of the semaphore, of a switch-detector comprising a sprocket-wheel engaged by the said operating-connections,
 115 and having face teeth, and a pawl adapted to engage with the said teeth and to be engaged and operated by a moving part of the said locking connections, substantially as set forth, and whereby when the switch is locked the
 120 pawl is disengaged from the said teeth but engaged therewith when the switch is unlocked, substantially as described.

2. In a railway signal, the combination with a stretcher-bar, a plunger for engaging there-
 125 with and provided with a beveled head, means for actuating the said plunger and engaging it with and disengaging it from the said bar, a sprocket-wheel having face-teeth, a chain engaging with the said wheel and forming a
 130 part of the operating-connection of a semaphore, and a pawl adapted at one end to en-

gage with the face teeth of the said wheel,
and at its opposite end to be engaged by the
beveled-head of the plunger, substantially as
set forth, and whereby the said wheel is left
5 free to rotate when the switch is locked, but
locked against rotation when the switch is
unlocked.

In testimony whereof I have signed this
specification in the presence of two subscrib-
ing witnesses.

FRANK N. KELSEY.

Witnesses:

FRED. C. EARLE,
GEO. D. SEYMOUR.