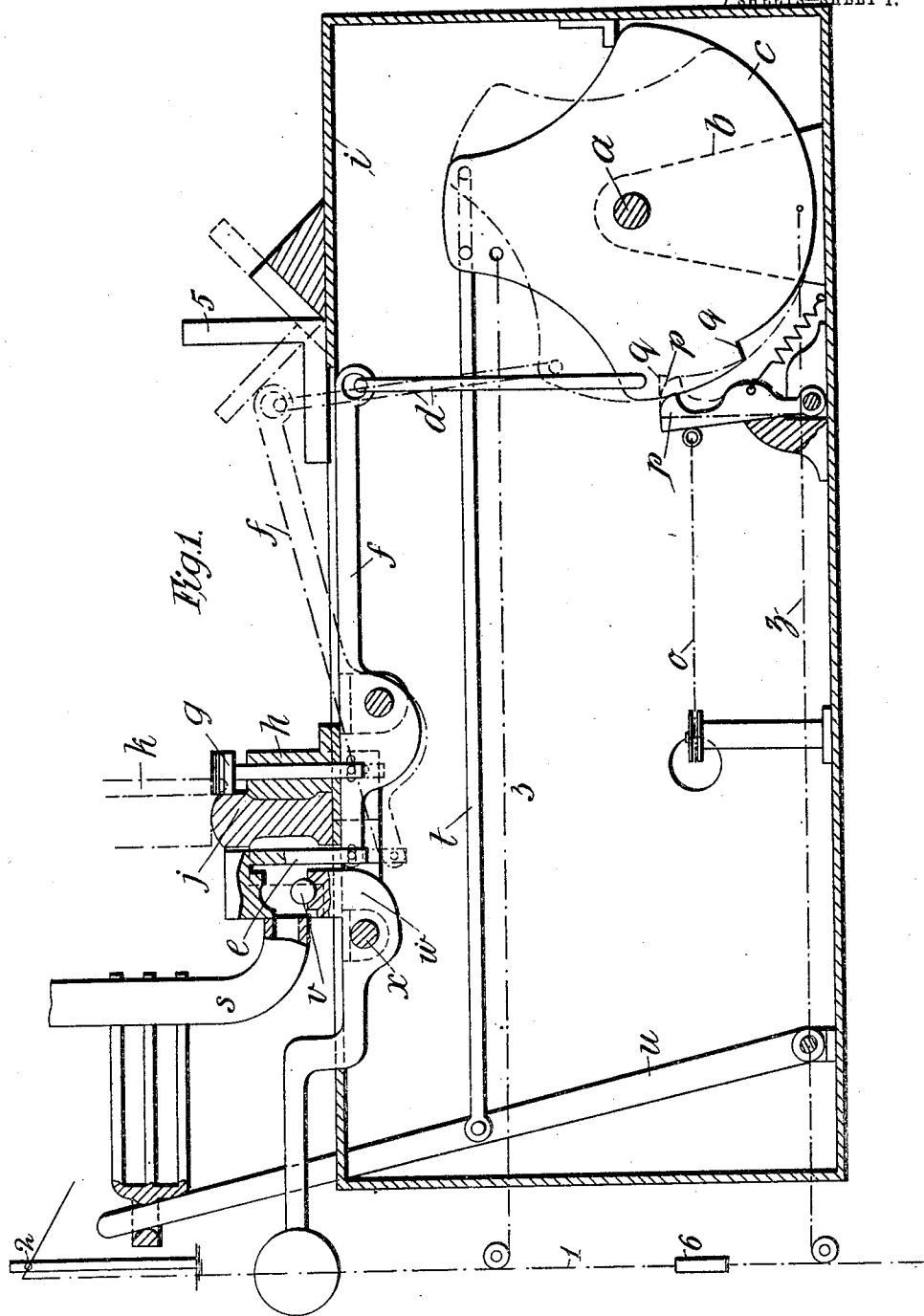


No. 810,011.

PATENTED JAN. 16, 1906.

J. WHEATLEY.
RAILWAY SIGNALING APPARATUS.
APPLICATION FILED MAY 15, 1905.

7 SHEETS—SHEET 1.



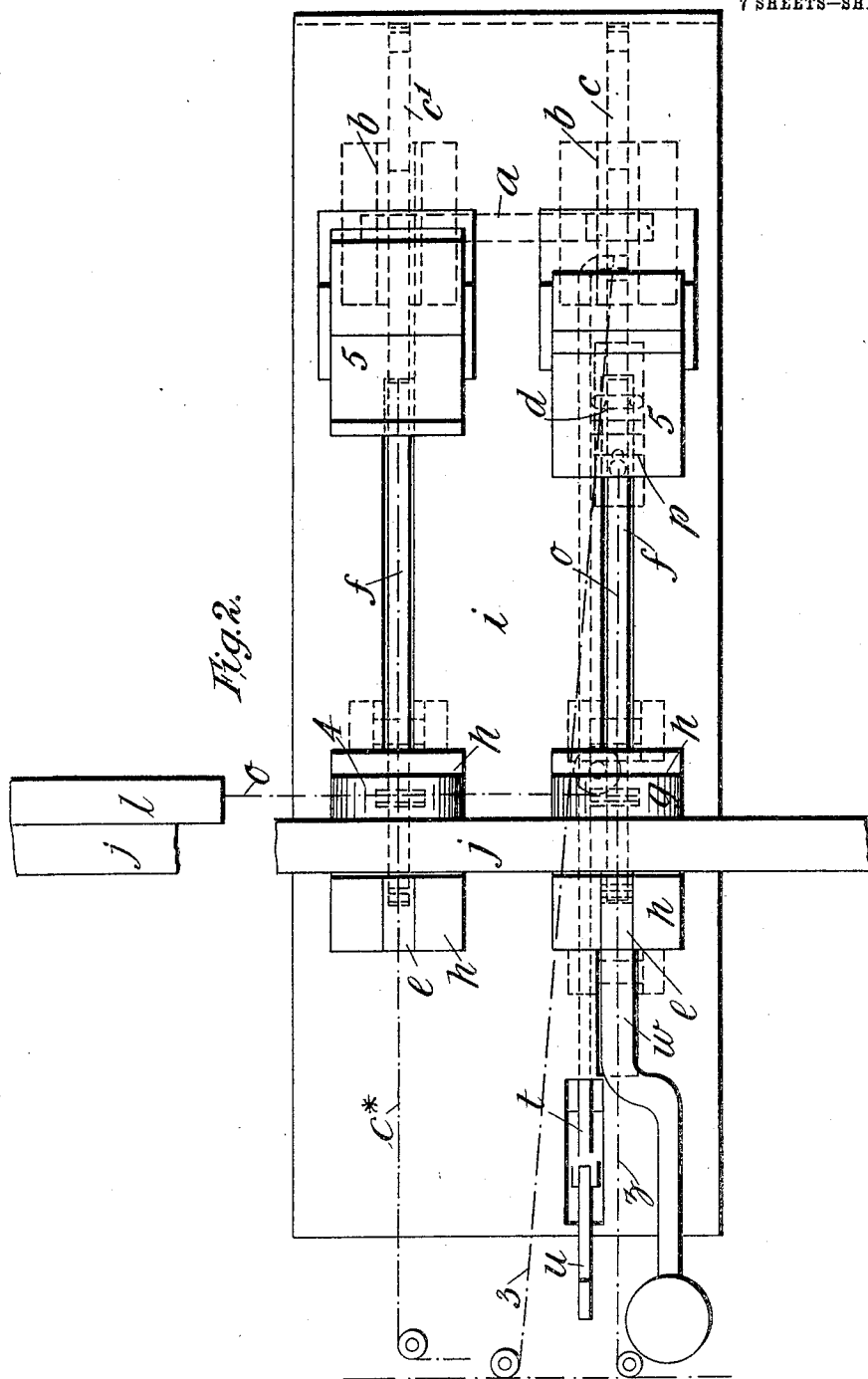
Witnesses.
Fercy. M. Goodwin.
Robt Hunter

Inventor: Jesse Whigley
By His Attorney *Wm. J. King*

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RAILWAY SIGNALING APPARATUS.

APPLICATION FILED MAY 15, 1905.

7 SHEETS—SHEET 2.



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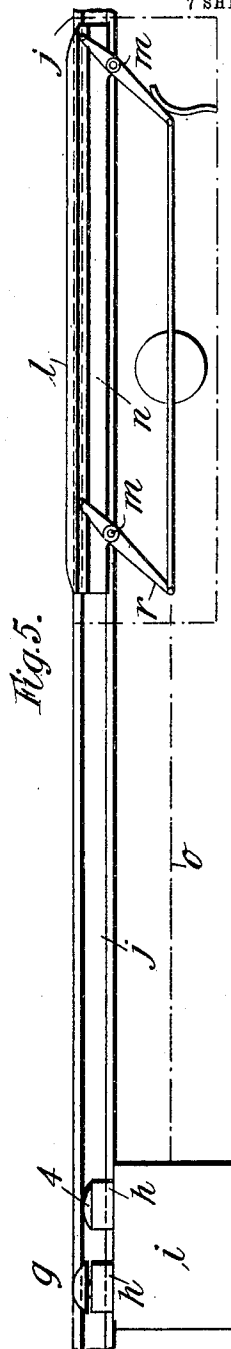
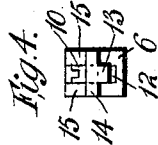
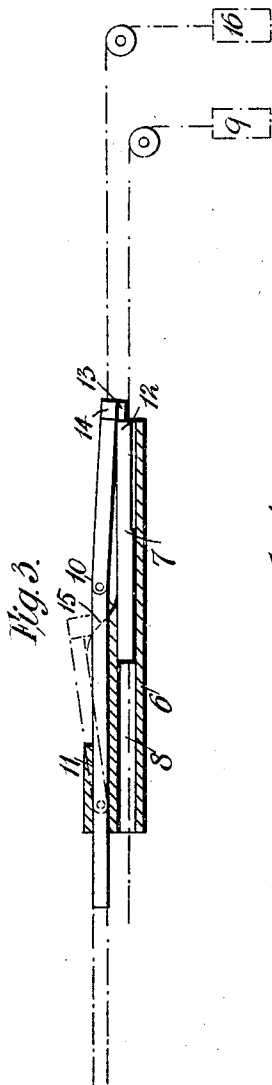
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7 SHEETS—SHEET 3.



Witnesses
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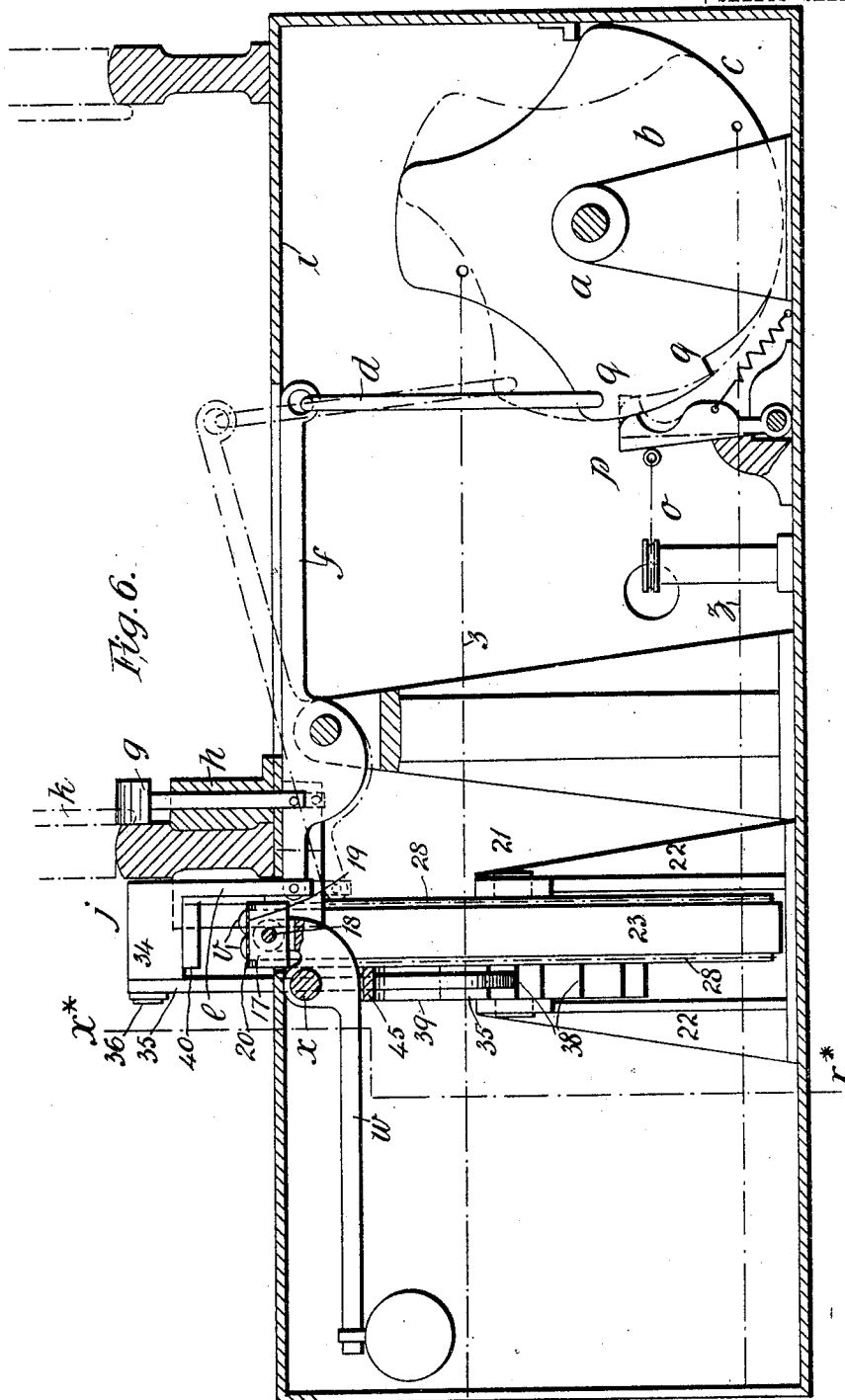
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7 SHEETS—SHEET 4.



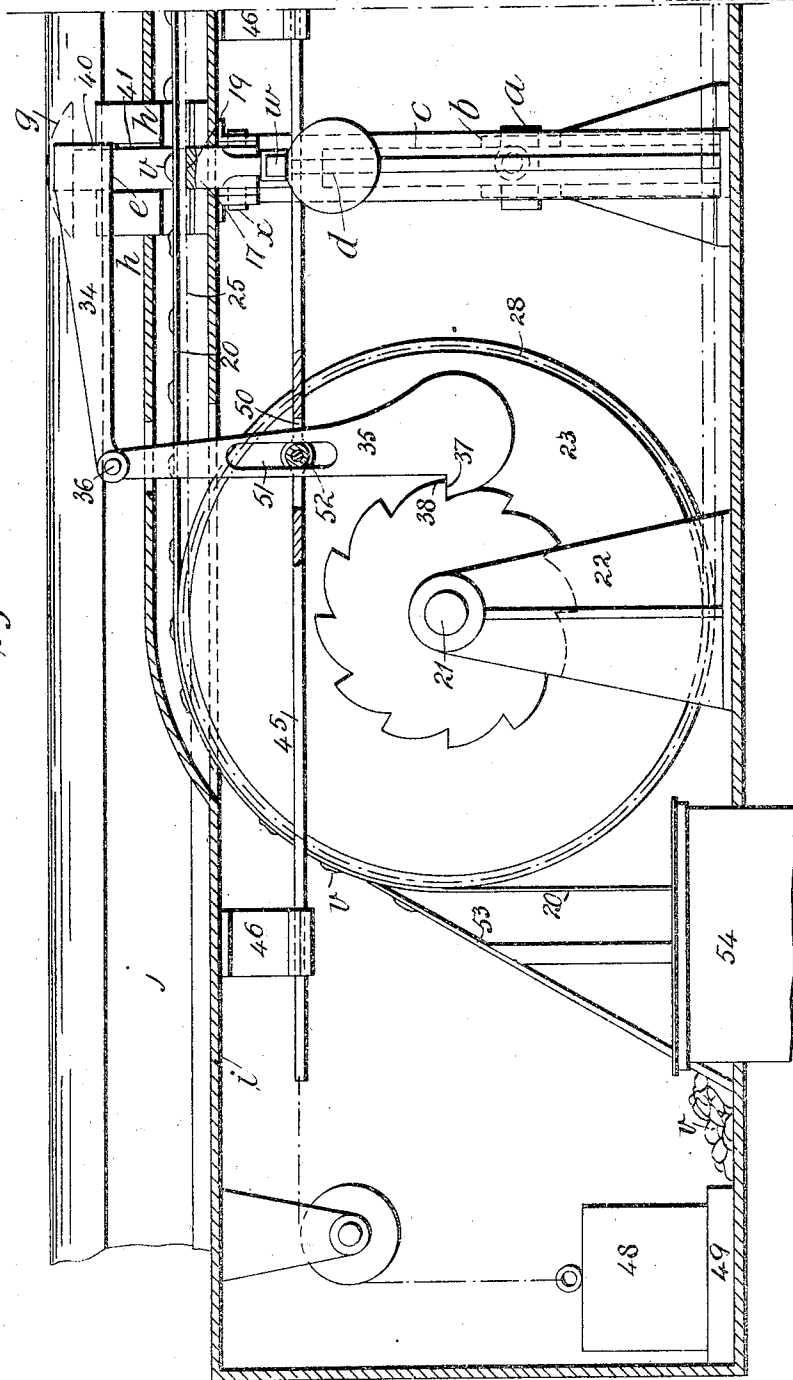
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APPLICATION FILED MAY 15, 1905.

• 7 SHEETS—SHEET 5.

Fig. 7.



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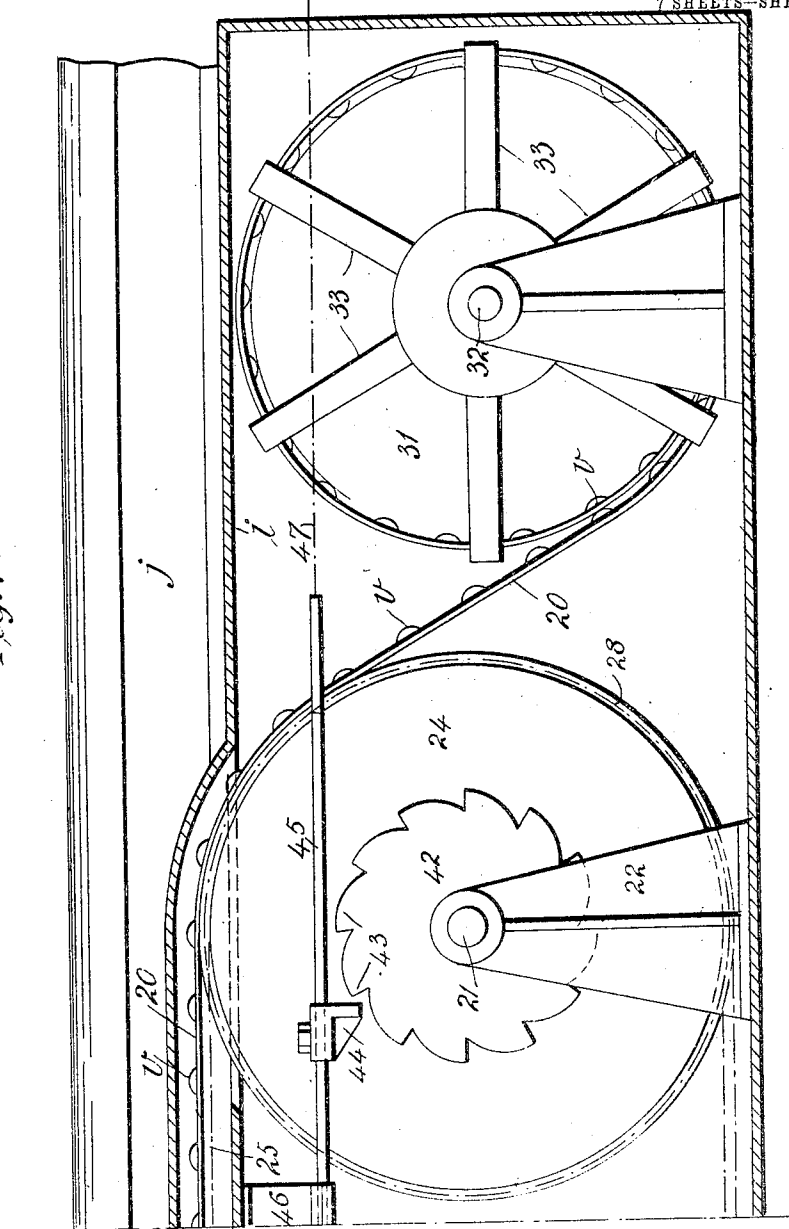
No. 810,011.

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RAILWAY SIGNALING APPARATUS.
APPLICATION FILED MAY 15, 1905.

7 SHEETS—SHEET 6.

Fig. 7a



Witnesses.
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UNITED STATES PATENT OFFICE.

JESSE WHEATLEY, OF EAST MOLESEY, ENGLAND.

RAILWAY SIGNALING APPARATUS.

No. 810,011.

Specification of Letters Patent.

Patented Jan. 16, 1906.

Application filed May 15, 1905. Serial No. 260,475.

To all whom it may concern:

Be it known that I, JESSE WHEATLEY, a subject of the King of Great Britain and Ireland, and a resident of Bridge House, East Molesey, county of Surrey, England, have invented certain new and useful Improvements in Railway Signaling Apparatus, of which the following is a specification.

This invention relates to improvements in railway signaling apparatus; and the object of my said invention is to prevent accidents occurring by reason of the signal not being seen during foggy or other weather and to provide by means of sound, denoting the state of the signal, whether at "danger" or "line clear;" further, to render it impossible for a train to pass over the apparatus according to my invention without the state of the road being given by a signal of sound as to whether "danger" or "line clear." Still further, should a train pass "line clear" and the signalman be taken suddenly ill and be unable to release the semaphore to "danger" by my apparatus, on another train approaching it could not pass without the danger-signal being given, though the semaphore remains still "line clear," and, still further, when such signal or sound is caused by the explosion of a detonator, to provide a means whereby the said detonators may be fed and exploded by the wheel of a passing train or engine or withdrawn from the exploding position without the intervention of a fogman.

In carrying my said invention into effect I mount on and in a box of suitable material and for the most part arranged under ground the mechanism for operating a bell or gong or for exploding a detonator or fog-signal, said mechanism being automatically set in motion by the wheels of the passing train. When it is desired to give two signals for trains, then the apparatus is duplicated and the duplicate set at some distance from the first one. In connection with my said apparatus I preferably employ a semaphore and lights working automatically with my invention, but arranged close to and lower down than those at present in use.

In order that my said invention may be readily understood, reference is to be had to the accompanying sheets of drawings, in which—

Figure 1 is a transverse section of an apparatus constructed in accordance with my invention. Fig. 2 is a plan view thereof, but with magazines removed. Figs. 3 and 4 are

detail views of the disconnecting apparatus, and Fig. 5 a diagrammatic view of the installation. Fig. 6 illustrates in transverse section a modified form of apparatus where only one pedal ("danger") is used; Fig. 7, a part cross-section on line $x^* x^*$ of Fig. 6; Fig. 7^a, the continuation of Fig. 7; Fig. 8, a detail view of band and chain and chain-wheel; Fig. 9, a cross-sectional view of the same, and Fig. 10 a perspective view of the danger-pedal.

Like characters of reference indicate corresponding parts in the several views.

In carrying my invention into effect with reference to Figs. 1 to 5 I arrange upon a shaft *a*, Figs. 1 and 2, carried in bearings *b*, one or more weighted levers *c*, each connected by rods *d* to a pivoted arm *e* by a second pivoted arm or lever *f*, to which is attached a pedal or treadle *g*, working in a guide-block *h*, fixed or attached to the box or casing *i*, said pedal or treadle *g*, hereinafter called "pedal," being arranged close to the rail *j*, over which the wheels of the train pass, the pedal being depressed by the flanges *k* of the wheels in so doing. Beyond the box or casing *i* and at a convenient distance I arrange a pedal or treadle rail *l*, (shown in diagram, Fig. 5,) pivotally connected at *m* to the non-movable part *n* of the pedal-rail fixed to the side of the rail *j*. The rail *l* I connect by rods, chain, or wire *o* to the locking-catch *p*, Fig. 1, in the box *i*, which locks the weighted lever *c* of the danger-pedal *g*. The unlocking and releasing of the weighted lever *c* by the action of the pedal-rail *l* is effected in the following manner: The weighted lever *c* being in the position shown in dot and dash, Fig. 1, the spring-controlled catch *p* engages with the recess *q* in the lever *c*, said catch being connected by the chain or wire *o* to the weighted arm *r* of the pedal or treadle rail *l*, which projects beyond the top of the rail *j*, so that on a train passing the rail *l* is depressed on its pivots *m*; but directly the train leaves the pedal-rail the same under the action of its weight immediately resumes its normal condition, thus withdrawing the catch *p* from the recess *q*, permitting the lever *c* to turn to position shown in full lines, Fig. 1, and in so doing to depress the pivoted arm or lever *f*, thereby raising the striking arm or lever (gong, bell, or detonator lever) and the danger-pedal *g* into the position shown. In the present case I have shown the pivoted or striking arm *e* as arranged for use with detonators, the same be-

ing fed from any suitable magazine *s* by means of the operating rod and lever *t* and *u*. The detonator *v* (exploded on the descent of the striking-arm *e*) rests on the anvil *w*, the same being pivoted at *x* to compensate for worn wheels depressing the pedal *g* too far down. The working of the line clear is done jointly with the action of the signalman in pulling the semaphore down by the wire, chain, or rod *z*, connecting the weighted lever *c* with the existing wire 1. of the signal as worked at present. To effect the working of the semaphore 2 from the weighted lever, the same is connected up by any suitable arrangement of wire 3, as shown in Fig. 1. By such action the weighted lever of the "danger" is moved and locked, the movement of the lever lowering the danger-pedal. In the same manner moving the "line-clear" weighted lever *c'* by wire or cord *c** causes its pedal 4, Fig. 2, to rise, the pedal being kept in its raised position by a weight 5, Figs. 1 and 2, falling and resting on the lever attached to the pedal. A similar weight 5 also assists in keeping the lever *f* in its down position. On the first wheel of the engine passing over the line-clear pedal the same is forced down. On the last wheel passing over the pedal-rail *l* the same rises automatically and releases the locking-catch *p*, and the danger-pedal *g* immediately rises to "danger," the line-clear pedal remaining down unless pulled up by the action of the signalman. Attached to the rod, chain, or wire connecting the rod or wire of the semaphore with my apparatus is a disconnecting device 6 (see Figs. 3 and 4) to partly disconnect my invention from the semaphore-wire, such device consisting of a bar 7, sliding in groove 8 under the action of the weight 9 and adapted to be withdrawn into said groove 8 by the hinged and hooked lever 10, working in groove 11, the hook 12 of lever 10 engaging the nose 13 of the bar 7, withdrawing said bar into groove 8 until the sides 14 of hook 12 ride up the inclines 15, thereby freeing the hook from the nose of bar 7, permitting said bar 7 to return to its original position under the action of the weight 8. On the signalman releasing bar 10 the same returns under the action of weight 16 into engagement with bar 7, so that the two bars may be worked together. By this means my invention is free to act automatically, and so goes to "danger" immediately a train has passed the pedal-rail, so that when the semaphore is pulled down to "line clear" my apparatus is also "line clear;" but directly the train has passed my apparatus automatically goes to "danger," even before the semaphore is released by the signalman. Should the signal be at "danger" and a train pass over, then the first wheel of the engine operates the danger-pedal, giving its warning sound, as above described.

In some cases I find it advantageous to dispense with the line-clear pedal and simply use one or more danger-pedals without departing in any way from my said invention. Such a construction and the method of feeding the detonators to the striking-arm or hammer-head are clearly set forth in the following description with reference to Figs. 6 to 10. In carrying this part of my invention into effect I mount, as in the previous case, on an axle *a*, carried in suitable bearings *b*, attached in any manner to the casing *i* of the apparatus, which is mounted for the most part under ground, a weighted lever *c*, connected to the striking-arm or hammer-head *e* by means of link *d* and lever *f*. Between the point of attachment of the lower end of the striking-arm to the pivoted lever I connect the lower end of the pedal or treadle *g*, adapted to be depressed by a train-wheel *h* and to work vertically in the block *h*, arranged on the upper side of the casing *i* in close proximity to one of the rails *j* of the road and inside thereof. (See Fig. 10.) The striking-arm *e* I likewise arrange to work vertically in a similar block *h* close to the other side of said road-rail. The lever *w*, carrying the anvil-block 17, on which the detonators *v* are exploded, I pivot at *x* to the under side of the casing or in any suitable position or manner and weight the outer end of said lever, and on the inner end of said lever I pivotally mount at 18 (see Fig. 6) the said anvil-block 17, so that the same may always present a horizontal surface 19 for the passage thereacross of a band 20, carrying the detonators *v*. To effect the feed of the band 20 of detonators across the face or surface 19 of anvil-block 17, I mount on pivots 21, carried in suitable bracket or bearings 22 and in line with said block, two wheels 23 and 24, (see Figs. 7 and 7^a), one on either side of said block 17, and connect said wheels together by endless chains 25 and 26; Figs. 7 to 9, engaging by recesses 27 on their under sides with teeth 28, formed on said wheels 23 and 24. On the upper side of said chains I arrange at suitable distances apart pins 29, adapted to engage holes 30 in the aforesaid band 20, and so on the rotation of the wheels 23 and 24 and chains 25 and 26 to positively move the band and its detonators, the same being attached thereon in any suitable manner. The band 20 of detonators *v* is fed or unwound from a roll 31, carried in suitable bearings or bracket 32 and provided with extending arms 33 to prevent said band from slipping sidewise. Connected to the striking-arm or hammer-head *e* by an extending arm 34 thereon I arrange a depending pawl 35, pivoted at its upper end 36 to said extending arm and adapted to engage by its hook or nose 37 on its lower end with the teeth 38 of a ratchet-wheel 39, (see Figs. 6 and 7,) arranged on the wheel 23, the pawl 35 being so arranged that on the hammer-head *e* being depressed it

rides over the teeth 38 of the ratchet-wheel; but on the hammer-head or striking-arm being raised it again engages the ratchet-teeth and rotates the wheels 23 and 24 one tooth, and consequently the band one tooth, bringing a fresh detonator or detonators over the anvil-block 17, where it or they are exploded by the engine-wheel in passing, depressing the pedal *g*, and consequently the hammer-head, onto said detonator or detonators and exploding the same, giving the danger-signal. To prevent the flash from the exploding detonator firing the succeeding detonator, I arrange on that side of the striking-arm *e* a plate 40, working in a groove 41 in the block *h* of said striking-arm, (see Figs. 6 and 7,) so that when said arm or head is down, the plate 40 is pressed onto the band 20, thereby preventing the passage of the flash to the next detonator. As in the previous case, beyond the box or casing and at a convenient distance I arrange a pedal or treadle rail, pivotally connected to the non-movable part of the pedal-rail, fixed to the side of the rail, said pedal-rail being connected by rods, chain, or wire to the locking-catch in the box which locks the weighted lever of the danger-pedal, the unlocking and releasing of the weighted lever by the action of the pedal-rail being effected in precisely the same manner as above set forth. To give "line clear," I provide on the wheel 24 a ratchet-wheel 42, but with teeth 43 reverse to the previous ratchet 39 on wheel 23. This ratchet-wheel 42 I operate by means of a cleat 44, arranged on a flat bar 45, carried in brackets 46, arranged in any suitable manner on the casing. One end of said bar I connect by wire or the like, 47, with a lever in the signal-box, having interposed between said bar and lever the disconnecting device, previously described and illustrated in Fig. 3, for partly disconnecting the signalman's wire from my apparatus. By this means the modified form of my invention is free to act automatically and so goes to "danger" immediately a train has passed the pedal-rail, so that when the semaphore is pulled down to "line clear" my apparatus is also "line clear;" but directly the train has passed my apparatus automatically goes to "danger" even before the semaphore is released by the signalman. Should the signal be at "danger" and a train pass over, then the first wheel of the engine operates the danger-pedal, giving the warning-sound, as above described. To the other end of said bar I connect a counterweight 48, whose travel is limited by a suitable stop 49. The bar 45 I provide with a slot 50, in which works the pawl 35 of the first ratchet-wheel 39, said pawl having arranged in its length a slot 51, in which works a roller or pin 52, carried by the flat bar 45, so that on the bar being pulled over from the signal-box the roller or pin 52, by engaging the sides of the slot 51

in the pawl 35, shifts said pawl from engagement with its ratchet-wheel 39. The cleat 44 in its continued rearward movement then engages the teeth 43 of the ratchet-wheel 42 on the wheel 24 and moves both wheels 23 and 24, through the medium of the chains 25 and 26, backward, thus withdrawing the detonator *v* from under hammer-head *e* and from off the anvil-block 17, leaving "line clear." To remove the exploded detonators from off the band 20, I provide any suitable arrangement of scraper 53, the band 20 passing to a receiving-tank 54 (from which it is withdrawn to be recharged) and the exploded detonators to one side thereof.

In fine weather the apparatus can be put out of gear by pulling up the weighted danger-lever in any suitable manner, as by lever and wire operated from the signal-box; but on the release of the lever it would at once go into gear and be at "danger."

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A railway signaling apparatus characterized by a "line-clear" pedal, a "danger-pedal," a striking arm or lever and a pedal-rail connected up to said pedals and operated by the flange of a wheel substantially as described.

2. A railway signaling apparatus characterized by a "line-clear" pedal, a "danger-pedal," weighted levers connected to said pedals, means for locking said weighted levers and a pedal-rail connected to said locking means and operated by the flange of a wheel substantially as described.

3. A railway signaling apparatus characterized by a "line-clear" pedal, a "danger-pedal," weighted levers connected to said pedals, means for locking and unlocking said weighted levers, means for partly disconnecting the apparatus from the semaphore and a pedal-rail connected to said locking and unlocking means and operated by the flange of a wheel substantially as described.

4. In a railway signaling apparatus of the kind set forth a device for partly disconnecting the apparatus from the semaphore with reference to Figs. 4 and 5 of the accompanying drawings consisting of a box or casing, upper and lower grooves to said casing, rods controlled by weights sliding in said casing, the upper rod being cranked and provided with a nose to engage the end of the lower rod so as to draw back the same, and means such as inclines on said casing to effect the release of the lower rod substantially as described.

5. In a railway signaling apparatus the combination with the danger-pedal, striking-arm and anvil and pedal-rail of a band of detonators and means for effecting the positive feed of said band to said anvil substantially as described.

6. In a railway signaling apparatus the combination with the danger-pedal, striking-arm and anvil and pedal-rail of a band of detonators and means for effecting the positive
5 feed of said band to said anvil and means for preventing the premature explosion of a succeeding detonator substantially as described.
7. In a railway signaling apparatus the combination with the danger-pedal, striking-
10 arm and pedal-rail of a pivotal anvil, a band of detonators to cross said anvil and means

for effecting the positive feed of said band to said anvil or to withdraw said detonators from off the anvil to give "line clear" substantially as described.

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

JESSE WHEATLEY.

Witnesses:

BENJ. THOS. KING,
ROBT. HUNTER.