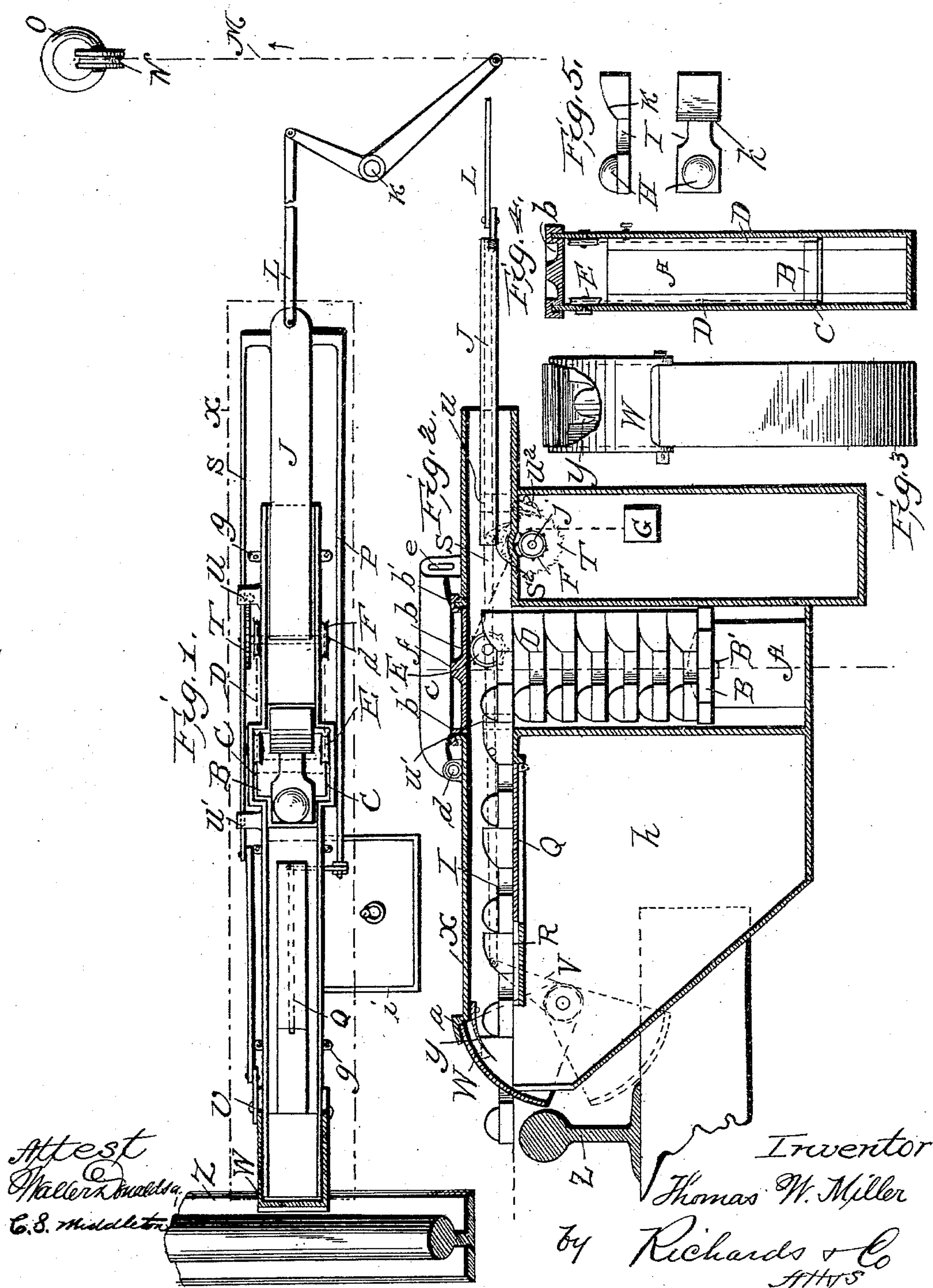


(No Model.)

T. W. MILLER.  
RAILWAY FOG SIGNALING APPARATUS.

No. 596,938.

Patented Jan. 4, 1898.



Attest  
Miller & Co.  
C. S. Middleton

Inventor  
Thomas W. Miller  
by Richards & Co  
Attys



# UNITED STATES PATENT OFFICE.

THOMAS WILLIAM MILLER, OF SYDNEY, NEW SOUTH WALES, ASSIGNOR  
TO PERCY BRERETON COLQUHOUN, OF SAME PLACE.

## RAILWAY FOG SIGNALING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 596,938, dated January 4, 1898.

Application filed November 14, 1896. Serial No. 612,072. (No model.) Patented in Victoria August 28, 1896, No. 13,440, and in England September 28, 1896, No. 21,462.

*To all whom it may concern:*

Be it known that I, THOMAS WILLIAM MILLER, engineer, a subject of the Queen of Great Britain and Ireland, and a resident of 82 Pitt Street, Sydney, in the Colony of New South Wales, have invented a certain new and useful Improvement in Railway Fog Signaling Apparatus, of which the following is a specification.

The invention has been patented in Victoria, No. 13,440, dated August 28, 1896, and in England, No. 21,462, dated September 28, 1896.

This invention relates to improvements in railway fog signaling apparatus; and it consists, essentially, first, of the peculiar construction of an underground magazine for detonators, from which a passage is provided to enable a detonator to be forced onto the rail by a sliding bar or piston; secondly, of the combination and arrangement, with an underground magazine, of sliding bars or pistons, of a counterbalance-weight, of bell-crank levers, and connecting rods or wires to actuating mechanism at a signal cabin or station; thirdly, of the combination and arrangement, with an underground magazine, of mechanism for raising the detonators into position in the feeding-passage and a shield to protect the end of detonator-passage.

Now this invention provides a means whereby a detonator may be placed upon the rail and held secure in the proper position until either exploded by a passing train or withdrawn from the rail and passed into a receptacle provided to receive the same, all operations being under the control of the signalman while in his cabin, the apparatus being placed at any required distance therefrom.

In order that the magazine may be kept properly charged with detonators, means is provided whereby an electric bell will ring in the signal-cabin, indicating when the number of detonators in the magazine has been reduced to any desired number. When this happens, it will be the duty of the signalman to have the magazine recharged.

In order that this invention may be more fully understood, reference will now be made to the accompanying sheet of drawings, in which—

Figure 1 is a plan of this improved apparatus with the covering-plate removed, also showing connection to bell-crank mechanism. Fig. 2 is a longitudinal sectional elevation of this improved apparatus. Figs. 3 and 4 are plan and side elevation of the detonator-mount.

A is the magazine, which may be constructed of any depth, according to the number of detonators required to be stored.

B is the carrier for supporting the detonators. This carrier is provided with the extended side pieces C, to which are attached the chains D, (one on either side.) These chains pass over the sprocket-wheels E and F and have a small weight G attached to the ends.

H is the detonator, secured to the mount I.

J is a sliding bar or piston connected to one arm of bell-crank K by the rod L. To the other arm of the bell-crank K is attached a wire M, leading one way to the operating lever or mechanism in the signal-cabin, the other way over the pulley N, and is secured to the counterweight O. To the sliding bar or piston J is attached on one side the rod P, used to operate another sliding bar or piston Q. This bar consists of a piece cut out of the center of the bed of the detonator-passage R. The rod S is secured to the other side of the sliding bar or piston J and carries on the under side a pawl to operate the ratchet-wheel T. This rod S after passing over the supports U and U' is jointed, so that the forward or rail end is below the level of the supports U and U' and is attached to the lever V, which lever operates the shield W.

X is the covering-plate, to which is secured a piece of metal Y, used for the purposes of preventing the detonator-mount going too far and for holding same in position on the rail Z. This piece of metal is forked to suit the shape of the detonator-mount.

a is the covering-stop on the covering-plate



X, in such a position that the end of the shield W when raising into position shown in dotted lines in Fig. 2 will be covered.

*b* is the trap-door over the magazine A, so placed to permit of the magazine being recharged. This door is provided with recesses *b'* on each side for the purpose of admitting the upward-turned sides of the covering-plate X, on the top of which may be placed strips of leather, gutta-percha, or any other suitable substance.

The clamp or lock *c* is hinged at *d*, and when this clamp is lowered into position shown in Fig. 2 it presses down the trap-door *b* through contact with *f*. The strips of leather or other material above mentioned will permit of the tightening down of the trap-door. The clamp or lock *c* is fastened at *e* by either a padlock, cotter, or any other suitable means.

The covering-plate X extends right over the apparatus, (shown in dotted lines in Fig. 1,) so that the apparatus may be protected from the weather, the shield W protecting the rail end, the covering-plate being bolted to the apparatus through the ears *g*.

*h* is a storage box or receptacle provided at the rail end of the apparatus to receive the unexploded detonators as they are withdrawn from the rail. This storage-box extends outward, so as to allow of a door *i* being placed on the top to permit of the unexploded detonators being removed therefrom.

The sprocket-wheels F and the ratchet-wheel T are keyed onto the spindle *j*, which is supported by hangers or in any other suitable manner.

To operate the apparatus and place a detonator on the rail, the signalman will actuate the mechanism in the signal-cabin and allow the weight O to fall. This will cause, by the intervention of the bell-crank K, the bar or piston J to enter the detonator-passage. This bar or piston has to enter the passage a sufficient distance before forcing the detonators along the passage to allow the rod S to operate the lever V and drop the shield W a sufficient distance, so that the detonator may pass onto the rail at the same time the rod P forces the bar Q toward the rail. This assists in carrying the detonator into the required position on the rail and supports it in the position. The metal clip Y prevents the detonator-mount going too far. When the detonator has reached the rail, the bar or piston J will have entered the passage so far as to cover the magazine and take the place of the topmost detonator. When it is required to remove the detonator from the rail, the signalman actuates the mechanism in the reverse way and thus draws up the weight O and causes the slides and rods to be withdrawn. The bar Q recedes, and while this is taking place the shield W is being raised and strikes the detonator, tipping it into the storage-box *h*. The slide J is also receding, and

when the end has cleared the magazine the pawl attached to the under side of the rod S engages with the ratchet-wheel T, causing it and the sprocket-wheels F to revolve just sufficient to raise the carrier B and bring another detonator into position. A second pawl *U*<sup>2</sup> is attached to the under side of the support U in such a position that it will engage with the ratchet-wheel T and prevent it revolving in the opposite direction. The pawl *S*<sup>2</sup>, secured to the under side of the rod S, is inoperative when moving toward the rail and only engages with the ratchet-wheel T after the bar J has left the space quite clear for the ascending detonator.

It will be obvious that many modifications may be made in the method of making the electrical contact. The detonator-mount I may be made of any suitable material and is shaped like two squares joined by a bar, as shown in Fig. 3. The detonator H is secured to one of the squares. The other square is covered. When the detonator is forced onto the rail, the forked piece of metal Y will fall into the recesses *k* of the detonator-mount I and will thus prevent the detonator going too far. It will also serve to hold the detonator in position on the rail.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. In apparatus for placing detonators upon rails; for the removal therefrom and the storage of unexploded detonators, the combination and arrangement with an underground magazine for detonators, such as A, having a passage such as R, to the rail, sliding bars such as J and Q, a shield such as W, bell-crank mechanism such as K, connecting rods or wires, such as L, and M, and counterweight such as O, substantially as herein described, explained, and illustrated in the drawings.

2. In railway fog signaling apparatus the combination and arrangement with an underground magazine such as A, a carrier such as B, lifting-chains such as D, ratchet-wheel such as T, sprocket-wheels such as E, and F, substantially as herein described, explained and illustrated in the drawings.

3. In railway fog signaling apparatus the combination, and arrangement with an underground magazine such as A, a sliding bar such as J, connected to rods such as S, and P, a shield such as W, a second slide such as Q, a forked metal stop such as Y, a detonator storage-box such as *h*, substantially as herein described, explained and illustrated in the drawings.

4. In railway fog signaling apparatus an underground magazine such as A, having a trap-door such as *b*, secured in position by a clamp or lock such as C, hinged to a covering-plate such as X substantially as herein described, explained and illustrated in the drawings.



5. In railway fog signaling apparatus the combination and arrangement with an underground magazine such as A, a detonator-mount such as I and a forked piece of fine metal such as Y, at the outlet end of the apparatus substantially as herein described, explained and illustrated in the drawings.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

THOMAS WILLIAM MILLER.

Witnesses:

OCTAVIUS PLATER CLAYTON,  
VERNEY LOVETT CAMRON.