(No Model.) 2 Sheets—Sheet 1.

M. O. GODDING.

DANGER SIGNAL FOR BRIDGES.

No. 384,755. Patented June 19, 1888.

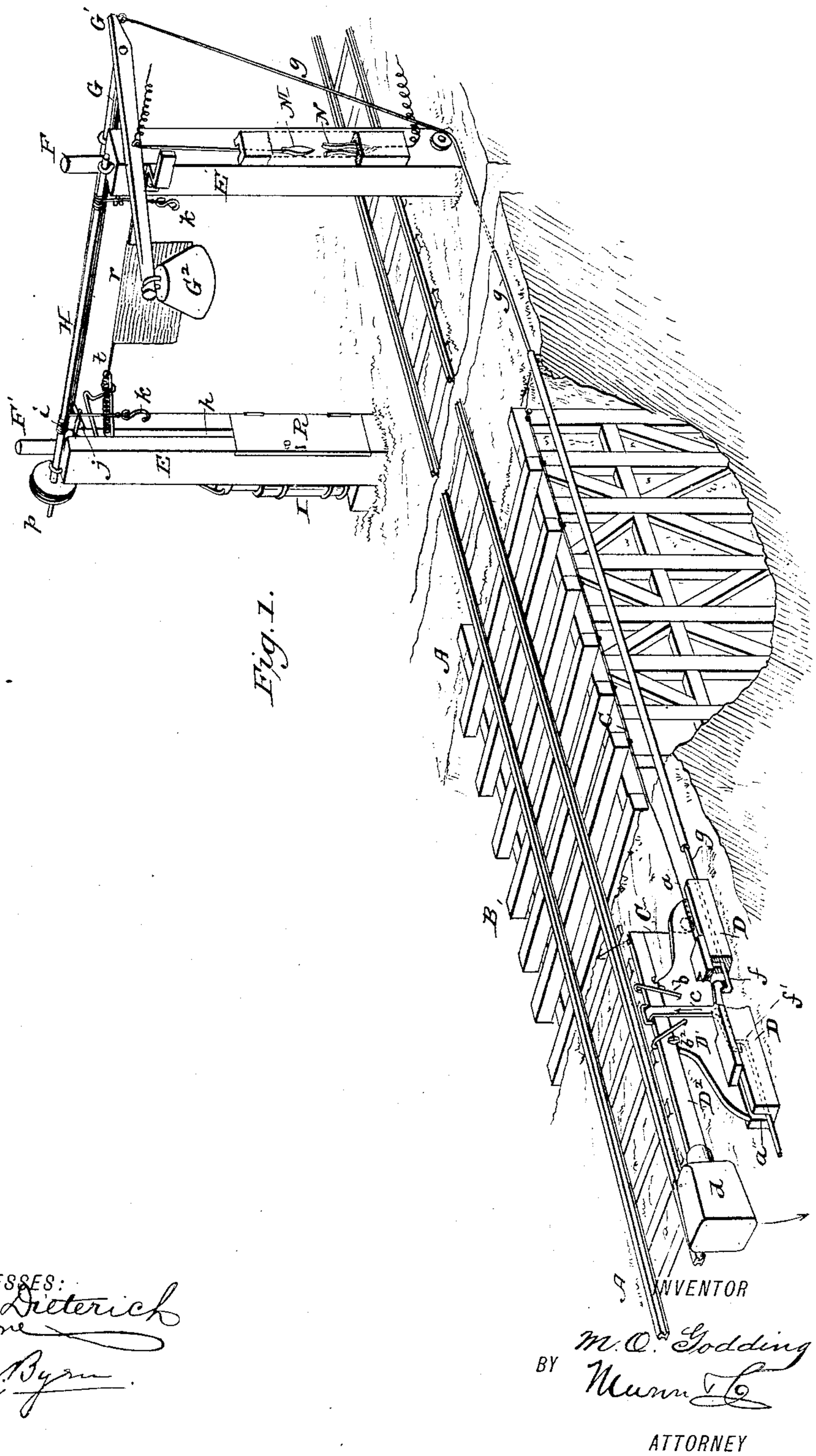

Fig. 1.

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 2.

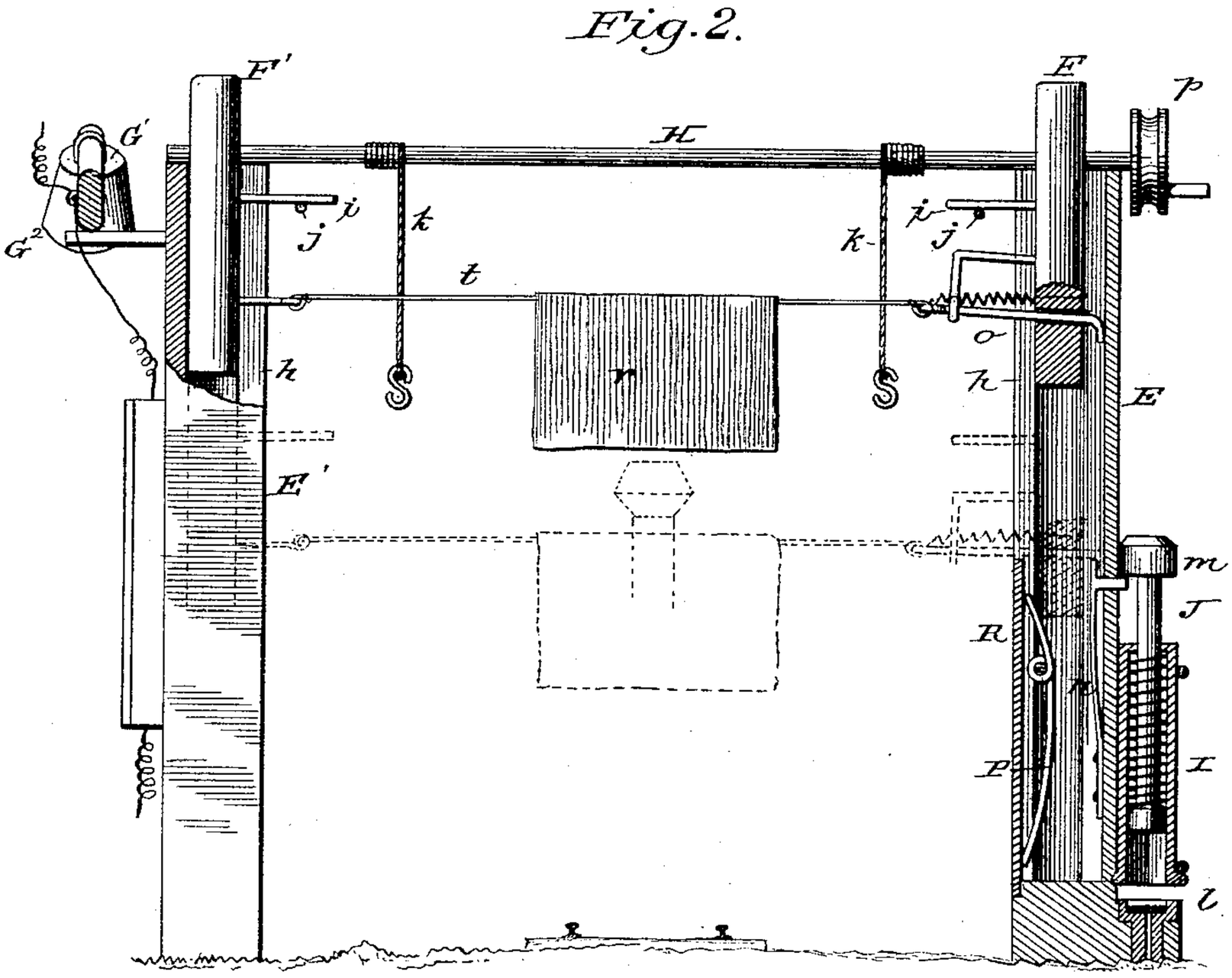


Fig. 3.

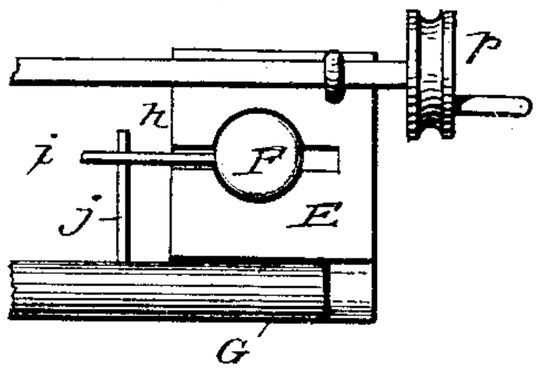
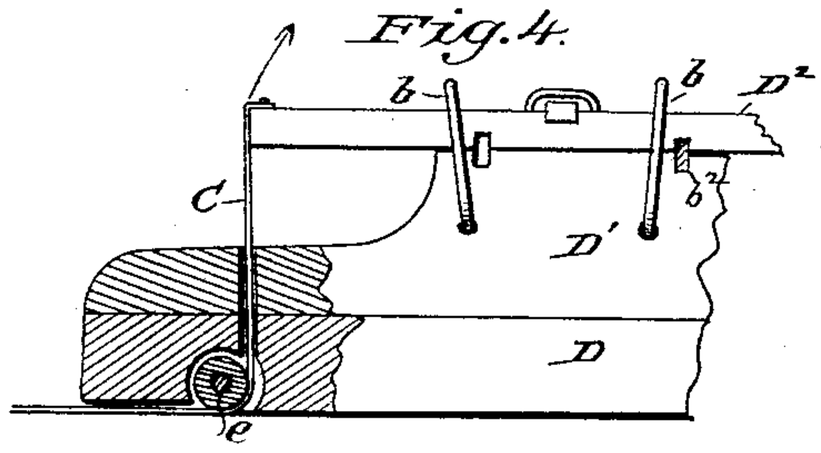


Fig. 4.



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UNITED STATES PATENT OFFICE.

MILON O. GODDING, OF MONROVIA, CALIFORNIA.

DANGER-SIGNAL FOR BRIDGES.

SPECIFICATION forming part of Letters Patent No. 384,755, dated June 19, 1888.

Application filed March 2, 1888. Serial No. 265,961. (No model.)

To all whom it may concern:

Be it known that I, MILON O. GODDING, of Monrovia, in the county of Los Angeles and State of California, have invented a new and useful Improvement in Danger-Signals for Bridges, Washouts, &c., of which the following is a specification.

The object of my invention is to provide a reliable danger-signal for notifying a moving railroad-train of the burning of a bridge or the destruction of the road-bed by a "washout" or "snow-slide," so that the train may stop in time to avoid the disastrous consequences of passing at full speed upon the broken track.

My invention consists in the peculiar construction and arrangement of tripping devices combined with a falling signal, and also in the means for exploding a cartridge, so as to permit the signal to be made known in the nighttime.

Figure 1 is a perspective view of my invention applied to a railroad-track and bridge. Fig. 2 is an elevation of the signaling devices, partly in section, the view being taken crosswise the railroad-track. Fig. 3 is a plan view of one of the posts, and Fig. 4 is a side view of a portion of the tripping device.

In the drawings, A represents a section of railroad-track.

B is a bridge, and C is a light combustible cord, of some such material as tarred rope, blasting-fuse, or other material that does not readily rot out and yet is easily ignited and quickly consumed. This cord extends across the bridge, and its severance by fire or by a washout or snow-slide is made to set in action a tripping device, which operates the signal. This tripping device consists of a bar, D, having a groove, *a*, in it, and a lever-support, D′, carrying at its top, within guides *b*, a lever, D^2, the lever D^2 being mounted upon support D′ by means of a fulcrum, b^2, and having a slight vertical play in the guides *b*. On the opposite side of the fulcrum b^2 from the weight *d* this lever has a forked trigger-extension, *c*, that runs down into the groove *a*, and said lever at one end has attached to it a weight, *d*, while the other end connects with the combustible cord C, which passes around a pulley, *e*, Fig. 4, and, extending across the bridge or other place to be guarded, is fastened securely to some stationary point, so as to hold the cord under a tension and hold the weight on the lever up and the forked extension *c* down. In the groove *a* of bar D is arranged longitudinally a sliding hook, *f*, whose hooked end is caught beneath one of the branches of the forked extension *c*, and which hook is connected to a wire, *g*, that extends along the road-bed for about a mile, or far enough to give the train time to stop after receiving the signal and before reaching the bridge. This wire *g*, for its better protection, may extend through a pipe or tube, or it may be carried on poles overhead. At the end where the signal is to be displayed it connects with the signaling devices, which are constructed as follows:

E E are two upright posts, placed firmly in the ground upon opposite sides of the track. These posts have vertical grooves in them, which open laterally along the inner sides of the posts in the form of slots *h*. In these grooves there slide two weights, F F′, which are connected together by a wire, *t*, extending from one to the other through the slots, and this wire bears in the middle, just above the railroad-track, a red-flag, *r*, or other signal. These weights are held up by means of their arms *i*, which rest on top of arms *j*, connected to a rock-shaft, G, journaled horizontally in bearings across the tops of the two posts. This shaft G has at one end a rigid lever, G′, whose long end carries a weight, G^2, and whose short end is attached to the wire *g*, which extends to the bridge, and the tension of which wire holds the weighted end of the lever G′ up, and holds up the arms *j* of the rock-shaft underneath the arms *i* of the weight. Now, when the bridge is burned, or the cord of the tripping device is ruptured by a washout or snow-slide, the weight on lever D^2 at the bridge tilts the lever, and, raising the forked extension *c*, allows the hook *f*, attached to wire *g*, to be released, and as the line of wire is thereby slackened, the weight on the lever G′ turns the rock-shaft G and by dropping the arms *j* allows the weights F F′ to fall in the grooves of the posts, carrying the attached signal-flag to a position low down on the track and directly in front of the locomotive, as shown by dotted lines, Fig. 2, thus giving the desired signal to the engineer. At all other times the signal-flag is maintained at an ele-

vated position far enough above the train to allow the latter to pass under it.

To raise the weights F F′ so as to set the signal again, I provide a windlass, H, on top of the posts E E′, with cords *k k*, having hooks at their lower ends for engagement with the arms *i* of the weight when it is desired to raise them to reset the signal.

Ordinarily in day-time the signal-flag gives sufficient warning of danger; but for use at night, when it may be difficult to see the flag, I provide an additional signal in the nature of an explosive cartridge, which gives a loud and distinct warning.

At one side of one of the posts I fix a case, I, Fig. 2, in which is a percussion-hammer, J, which may act either from a spring, as shown, or by its own gravity. This hammer is arranged to be released by the pull caused by the locomotive against the flag-wire *t*, and when released drops upon a dynamite cartridge contained in a seat, *l*, below the hammer. The hammer is provided with a notch or shoulder, *m*, on its side, to receive the locking end of a spring-rod, *n*, in the groove of post E, which rod holds the hammer up.

In fastening the signal-flag wire to its weight it is not directly attached to the weight, but is fastened to a spring-bolt, *o*, which has a hook on its outer end, and when the signal is down this hook engages with the top of spring-rod *n*, so that when the locomotive strikes the signal-wire it pulls back the spring-bolt *o* and catch-rod *n*, and the hammer is allowed to fall and explode the cartridge. To raise the hammer again, in case a heavy one or strong spring be used, a cord may be attached to it and wound up upon a pulley, *p*, on the windlass above.

M N, Fig. 1, are electric contacts, which are arranged to be brought together by descent of lever G′ to complete a circuit to the stations on each side to notify the station-agents that an accident has occurred to the road-bed.

A set of signal-posts is to be arranged on both sides of the bridge, and in order to connect with both the tripping device is made with a double-branched forked extension, *c*, with one branch arranged to co-operate with a hook, *f*, and tension-wire extending in one direction, and the other branch co-operating with a hook, *f′*, and tension-wire with signal devices extending in the opposite direction, which latter it is not necessary to show, as they are duplicates of those already illustrated. As a very slight vertical movement of the extension *c* is sufficient to release the hooks *f f′*, the lever D^2 has but very little play in the guides *b*.

P is a lever by which the spring-rod *n* is forced out when setting the percussion-hammer, and R is a door for closing up the opening in the lower part of the post to prevent access thereto.

Having thus described my invention, what I claim as new is—

1. The combination, with a cord, C, adapted to be distended along the railroad-track, of the bar D, having groove *a*, weighted lever D^2, distending the cord, the trigger-extension *c*, and a hooked line-wire extending to a distance and provided with signaling devices, substantially as and for the purpose described.

2. The combination, with a combustible cord arranged upon a bridge, of signaling devices connected to and operated at a distance from the bridge by the burning of said cord.

3. The combination of the tripping devices, the tension-wire *g*, and the signaling devices, consisting of a rock-shaft with a lever connected to the wire and two arms, vertical posts having sliding weights arranged in grooves in the posts and supported by the arms of the rock-shaft, and a cross-connection for the two weights bearing a signal, substantially as and for the purpose described.

4. The combination, with the percussion-hammer, of a catch-rod arranged in one of the posts, the sliding weights, one of which is provided with a spring-hook arranged to release the catch-rod, and a connecting-wire for the two weights, one end of which is attached to the spring-hook to release the percussion-hammer, as described.

The above specification of my invention signed by me in the presence of two subscribing witnesses.

M. O. GODDING.

Witnesses:
EDWD. W. BYRN,
CHAS. A. PETTIT.