

G. M. STILL.
 TRAIN FUSEE DISCHARGER.
 APPLICATION FILED JUNE 13, 1913.

1,132,631.

Patented Mar. 23, 1915.
 2 SHEETS—SHEET 1.

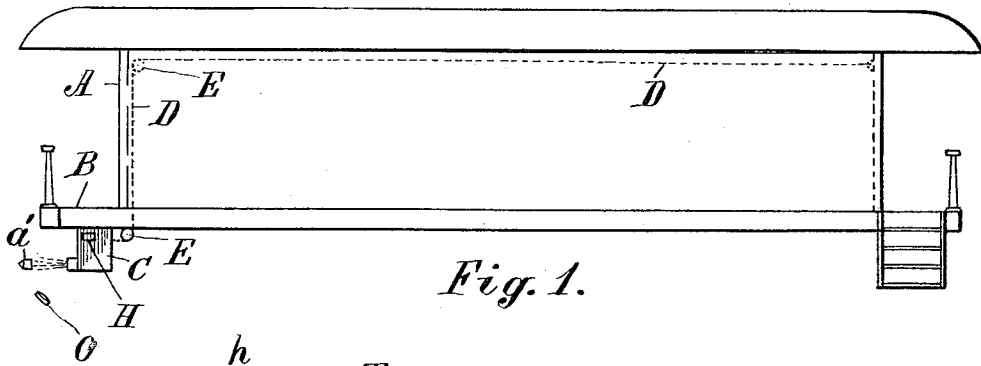
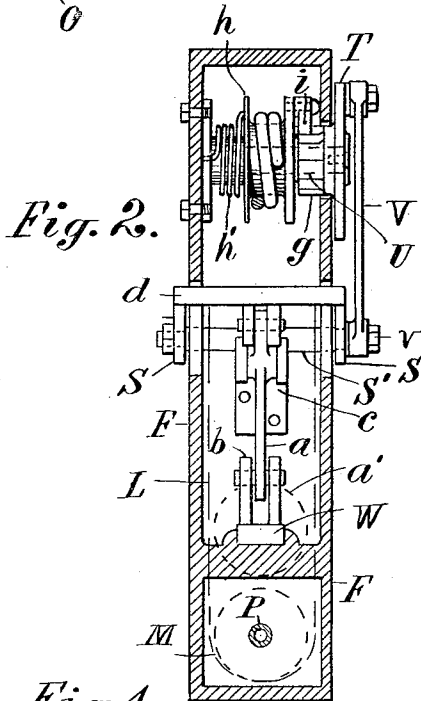
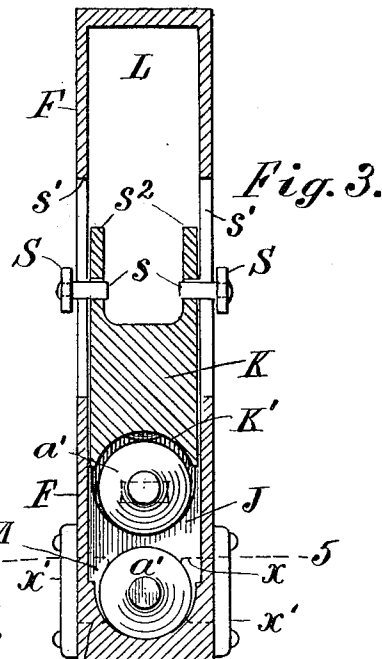
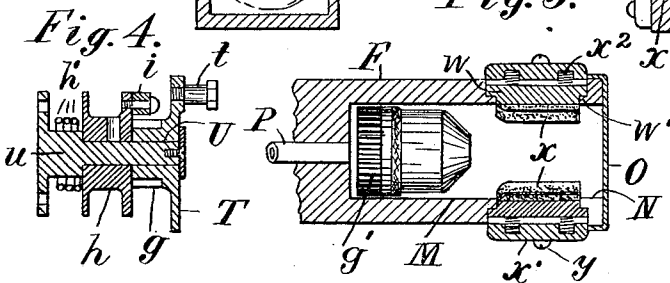
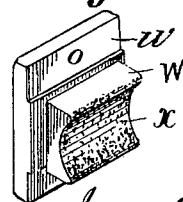


Fig. 5.

Fig. 6.



Witnesses:
 L. Lee
 Walter Greenbow

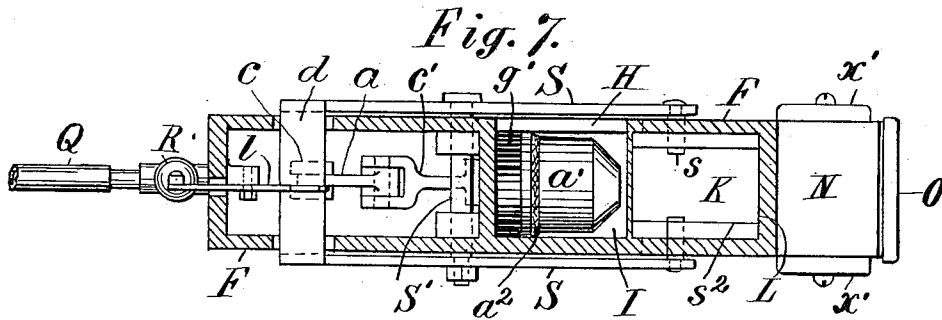
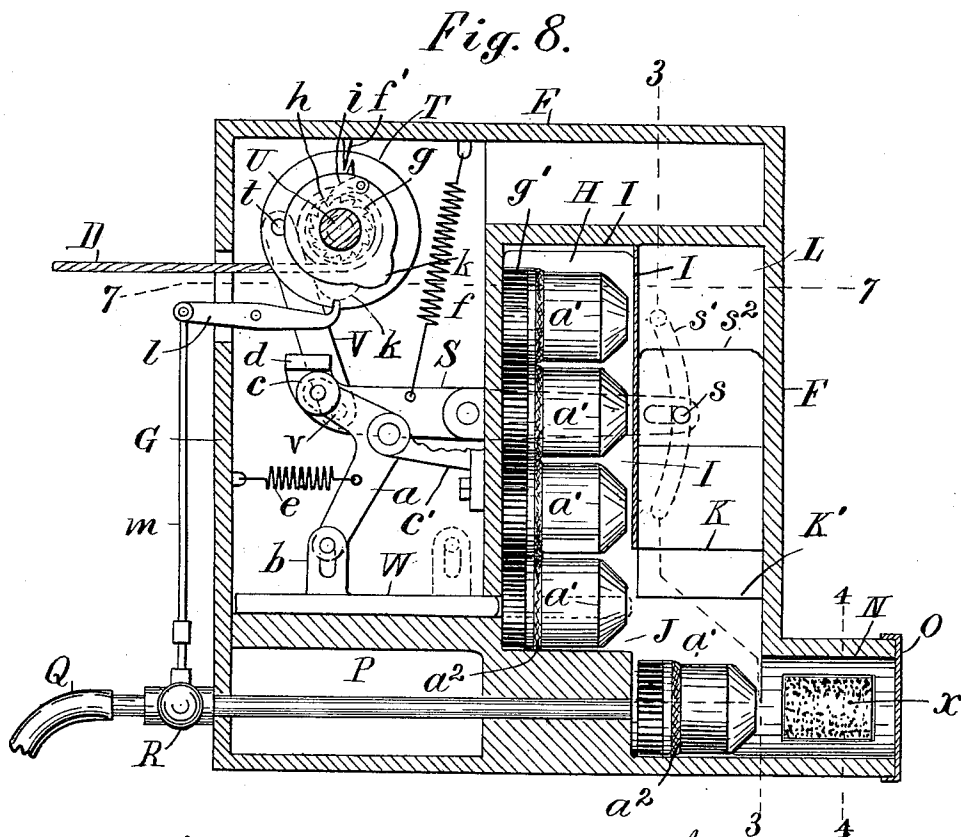
Inventor.
 George M. Still, per
 Thomas S. Crane, atty.

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2 SHEETS-SHEET 2.



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UNITED STATES PATENT OFFICE.

GEORGE M. STILL, OF NEW YORK, N. Y.

TRAIN-FUSEE DISCHARGER.

1,132,631.

Specification of Letters Patent.

Patented Mar. 23, 1915.

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To all whom it may concern:

Be it known that I, GEORGE M. STILL, a citizen of the United States, residing at 195 Third avenue, New York, county of New York, and State of New York, have invented certain new and useful Improvements in Train-Fusee Dischargers, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

The present invention relates to a means of warning a railroad train at night, and the object of the invention is to furnish a means of mechanically discharging from the rear platform of a car a so-called "fusee" or colored burning signal, adapted to warn any succeeding train that the track is obstructed. Such "fusees" are commonly kept in a portable case, which is often carried by a train-hand from one train to another, and deposited somewhere upon the rear car of the train. Such "fusees" are often provided with a spike to stick in the ground and require to be lighted by a match, and are preferably stuck in the ground if the train stops or slows up sufficiently for the trainman to leave the car and return to it.

The delay occasioned by looking for the case of "fusees" when one is required, and of leaving the train and lighting a "fusee," often in a high wind which is liable to blow out matches, greatly increases the danger of collision when trains are operated under short headway. In suburban service where trains move under only two or three minutes headway, a little delay in placing such a warning signal sometimes results in an accident, which could be avoided if the "fusee" could be mechanically discharged by the trainman or any passenger when the train was unexpectedly stalled.

The present invention furnishes a means by which "fusees" may be stored in a magazine, and without stopping or slowing up the train, may be discharged from a barrel, and the "fusee" automatically lighted as it is discharged from the barrel, and the entire apparatus operated by a pull-cord arranged in any convenient location in the car. By extending the cord the entire length of the car, the trainman or a passenger can, when necessity arises for warning a succeeding train, grasp the rope at any point in the car and thus discharge a lighted "fusee" upon

the track in the path of the succeeding train. This mechanism thus avoids the necessity of stopping or slowing up the train, or the delay arising by the trainman getting his "fusees," leaving the train, and then returning to the car.

The invention also enables passengers, or others who are exposed to danger by the unexpected stalling of a train, to actuate the fusee-discharger by merely operating the pull-rope, in the same manner that the brakes can be applied to a train by anyone through the medium of the pull-rope provided for that purpose.

The invention involves the provision of a lighting fuse upon the exterior of a "fusee," charged with material capable of ignition by rubbing against a prepared pad, like the safety matches now widely used, and such ignition is secured by providing one or both sides of the barrel through which the "fusee" is discharged, with such a pad; and locating the fuse upon the exterior of the "fusee" so that some portion of the fuse will positively contact with the pad or pads.

The fuse may be disposed in an annular groove upon the circumference of the "fusee" and projected sufficiently to rub upon the pad in the desired manner, or may be folded backwardly from the nozzle of the "fusee;" either arrangement securing the positive ignition of the fuse and the "fusee."

The invention will be understood by reference to the annexed drawing, in which—

Figures 1 to 8 show an apparatus to operate a "fusee" of special construction with a metallic case having the fuse wrapped around the body, and the bottom weighted to hold it erect. Fig. 1 is a side-elevation of the car-body provided with a fusee-discharger; Fig. 2 is a rear view of the apparatus with its cover G removed; Fig. 3 is a section on line 3—3 in Fig. 8; Fig. 4 is a longitudinal section of the rope-drum and its attachments; Fig. 5 is a horizontal section of the fusee-chamber on line 5—5 in Fig. 3; Fig. 6 is a perspective view of one of the igniting pads; Fig. 7 is a section on line 7—7 in Fig. 8; and Fig. 8 is a vertical section near the left-hand side of Fig. 2.

In Fig. 1, A designates the body of a car, B the rear platform with the steps omitted, and C the entire fusee-discharger fixed beneath the platform and having a pull-rope D carried over pulley E and extended the

entire length of the car. The fusee-discharger is shown with a casing F having a doorway H for inserting "fusees" a' in a magazine I. Any of its sides may be made removable for access to the mechanism. One edge of the magazine at the bottom is provided with an aperture J, and a gate K is movable in a passageway L at one side of such aperture. The passageway terminates at the bottom in a fusee-chamber M from which a barrel N is projected to contain the igniting pad.

The barrel is shown with a detachable cap O fitted upon its nozzle to exclude dust and dirt from the barrel and fusee-chamber; such cap being driven off when a "fusee" is discharged and afterward replaced by another. The barrel is cylindrical, the bottom of the fusee-chamber is semi-cylindrical and the lower end of the gate K is formed with quadrantal wings K' which form the upper half of the fusee-chamber when the gate is closed.

The "fusees" a' are shown with a fuse a^2 which is cemented in a groove around the middle of the "fusee's" length, and coated with combustible material adapted to ignite when rubbed against the prepared surface x of the pads w which are shown arranged in both sides of the barrel N. Apertures are formed in the walls of the barrel to insert the pads, and are provided with ledges w' at their opposite sides. The pads are formed, as shown in Fig. 5, with a body-block w having lugs at opposite ends to rest normally upon the ledges, and caps x' are secured over the apertures and provided with spiral springs x^2 which press upon the backs of the blocks and hold them elastically against the ledges.

The prepared surfaces x of the pad are secured renewably to the blocks w , and stand normally a little closer together than the width of the "fusee" so that when the latter is discharged through the barrel it crowds against the prepared surfaces sufficiently to rub the fuse upon the surfaces x and thus ignite it.

The fuse is extended within the "fusee" to ignite the contents, which thus burn as soon as the "fusee" is discharged. The "fusee" may be expelled from the barrel, by compressed air, or other means.

In Fig. 8, a compressed air-pipe P is shown extended from the rear of the fusee-chamber and connected with a supply-hose Q, and a trip-valve R is inserted in the pipe to be opened momentarily for discharging the "fusee". Levers S are pivoted upon opposite sides of the casing and connected by shaft S' and cross-bar d , and pins s are extended from the arms through slots s' in opposite sides of the casing to engage plates s^2 projected upward from the gate K within the passageway L. A disk T having a

crank-pin t thereon is journaled loosely upon a stud U within the casing and the crank-pin connected by a rod V with a pin v upon one of the arms S; so that the rotation of the crank-wheel oscillates the arms and reciprocates the gate. Such rotation is produced by a spiral spring h' after each actuation of the pull-rope D. The stud U is carried by a boss u attached to the casing F, and a spiral spring h' is coiled around the boss and its ends attached respectively to the boss and the rope-drum h . A ratchet-wheel g is attached to the disk T, and a rope-drum h is fitted to turn upon the stud adjacent thereto and provided with a pawl i to engage the ratchet-wheel when moved in the direction reverse to the pull of the rope. The drum-flange has a dog k adapted to operate upon a lever l which trips the air-valve by means of a rod m and permits the valve thereafter to immediately close, such momentary opening sufficing to discharge a "fusee" from the barrel N. The dog is disposed, as shown in dotted lines k in Fig. 8, so as to open the air-valve upon the first movement of the rope D, the continued movement of the rope operating to turn the drum a complete revolution (to the stop f) in opposition to the resistance of the spring h' , the pawl i meanwhile slipping over the teeth of the ratchet-wheel, and engaging the same as soon as the pull-rope is released, so that the wound spring then operates immediately to turn the crank-disk a complete revolution.

A pusher-slide W is inserted through the wall of the magazine to push the bottom "fusee" through the aperture J from which it falls into the fusee-chamber N. The pusher is reciprocated by a bell-crank a pivoted within the casing upon a bracket c' between the two levers S, one arm being connected to ears b upon the pusher W, and the other arm being provided with a roller c adapted to contact with the cross-bar d upon the levers S when the gate has opened the aperture J.

The parts are so proportioned that the arms S move the gate upward in the passageway L after it has opened the aperture, during which movement of the arms the pusher is reciprocated to shift a "fusee" from the magazine to the fusee-chamber, any succeeding "fusee" in the magazine then dropping down in the place of the one discharged, as soon as the pusher is withdrawn. A spring e operates upon the bell-crank to retract the pusher when the rise of the lever S permits, and a spring f operates to hold the outer ends of the lever S normally lifted and the gate K normally depressed to close the fusee-chamber. The pulling of the rope turns the drum idly upon the stud, with the pawl slipping over the ratchet-teeth; and the purpose of the con-

struction is to permit the turning of the drum to trip the air-valve without moving any of the other mechanism, the turning of the drum winding up the spiral spring h' which actuates the other mechanism when the pull-rope is released. The gate K thus remains closed during the discharge of a "fusee", and the gate is lifted and another "fusee" shifted into the fusee-chamber by the operation of the spring upon the crank-disk by means of the pawl and ratchet, when the pull-cord is released. Such turning of the crank-pin during the first quarter of its revolution (to the position shown in Fig. 6) lifts the gate from the aperture J, and brings the cross-bar upon the levers S in contact with the bell-crank. The next quarter of a revolution lifts the gate idly in the passageway L while the action of the arms S upon the bell-crank advances the pusher W to shift the bottom "fusee" from the magazine into the chamber M. As soon as the crank-pin t has passed below the stud U, the spring f operating upon the levers S and the rod V, pushes the crank-pin up to its initial position and holds it there, thus locking the gate K over the top of the fusee-chamber.

The "fusees" shown in Figs. 5 to 8 are very short and larger in diameter than those commonly used, so as to facilitate shifting them in the apparatus, and when discharged their weighted end falls downward so as to hold them erect upon the ground.

When the ordinary "fusees" are thrown from a car with the fuse lighted, the spike sometimes sticks in the ground, but often otherwise; the light continuing in either case, so as to produce the required signal, so that the discharge of the "fusees" with the head first does not deliver them from the ground in any different condition than if they were thrown by hand.

Having thus set forth the nature of the invention what is claimed herein is:

1. In a train fusee-discharger, the combination, with a receptacle having a discharge-barrel and means to propel the "fusee" therethrough, of means attached to the barrel for igniting the "fusee" in its discharge therefrom.

2. In a train fusee-discharger, the combination, with a receptacle having a discharge-barrel and means to propel the "fusee" therethrough, of a fuse upon the exterior of the "fusee", and a friction-rubber in the barrel adapted to ignite the fuse as the "fusee" is driven past it.

3. In a train fusee-discharger, the combination, with a receptacle having a discharge-barrel and means to propel the fusee therethrough, of a fuse upon the exterior of the "fusee", and friction-rubbers inserted in opposite sides of the barrel in the path of the "fusee" and pressed normally inward

by springs and adapted to ignite the fuse when the "fusee" is driven between the friction-rubbers.

4. In a train fusee-discharger, the combination, with a discharge-barrel having a receiving-chamber, of a magazine supplied with "fusees" each having a fuse upon the exterior and said magazine having means for shifting the "fusees" successively into such chamber, means upon the side of the barrel to ignite the fuse, and means for discharging the "fusees" through the barrel.

5. In a train fusee-discharger, the combination, with a discharge-barrel having a chamber to receive the "fusee", of a movable gate forming one side of the chamber, a magazine with an aperture at one edge of the gate, means when the gate is lifted for shifting a "fusee" from the magazine to the chamber, and means connected together to operate automatically for first opening the gate and a pusher with means for advancing it to shift one of the "fusees" to the chamber.

6. In a train fusee-discharger, the combination, with a discharge-barrel having a chamber to receive the "fusee", with means for supplying compressed air thereto, of a movable gate forming one side of the chamber, a magazine with aperture at one side of the gate, a lever for lifting the gate, a pusher operated by the lever when the gate is lifted for shifting a "fusee", and mechanism operated by a spring for moving the lever, a pull rope, and means operated thereby to place the spring under tension by the movement thereof when such rope is actuated.

7. In a train fusee-discharger, the combination, with a discharge-barrel having a cylindrical-chamber to receive the "fusee", with a pipe for supplying compressed air thereto and a valve in the said pipe, of a movable gate forming one side of the chamber, a magazine with aperture at one edge of the gate, a lever for lifting the gate, a pusher operated by the lever to shift a "fusee" when the gate is lifted, a shaft having a spring-rotated crank with connection to the lever for actuating the same, a rope-drum rotatable upon such shaft and having a ratchet-connection to the crank and a spring-wound by the rope-drum when the rope is pulled, and means actuated by the drum when the rope is pulled to trip the compressed air-valve to discharge a "fusee".

8. The combination, with a railroad car, of a fusee-discharging apparatus secured under the platform of a car and having a magazine supplied with "fusees" each having an ignitable fuse, a barrel with a fusee-chamber and friction-rubber adapted to ignite the fuse upon the "fusee", a pipe supplying compressed air to the fusee-chamber with a trip-valve in the said pipe, a pull-rope

in the ear extended to the apparatus, means
actuated by the rope to first trip the valve
and discharge a "fusee" from the barrel,
and secondly, to shift a succeeding "fusee"
5 from the reservoir to the fusee-chamber and
close the said chamber.

In testimony whereof I have hereunto set

my hand in the presence of two subscribing
witnesses.

GEORGE M. STILL.

Witnesses:

L. LEE,

THOMAS S. CRANE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."