June 19, 1951 W. P. BOVARD 2,557,254

WARNING SIGNAL FOR RAILROADS

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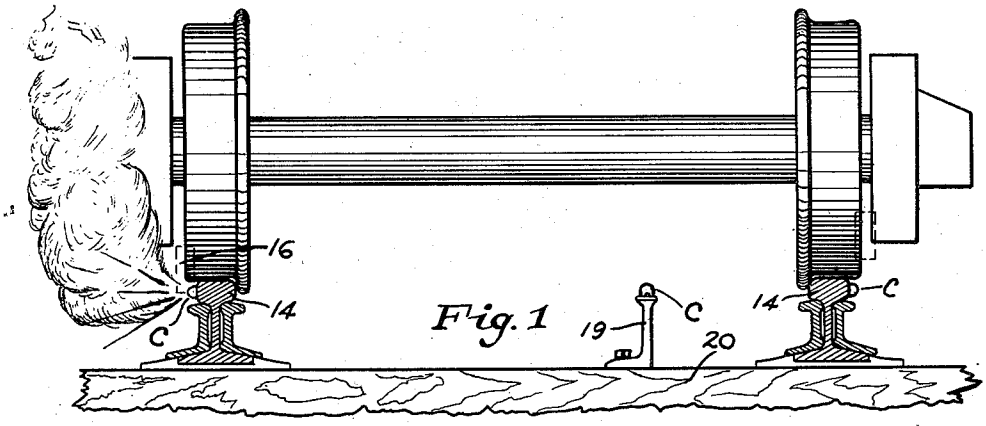


Fig. 1

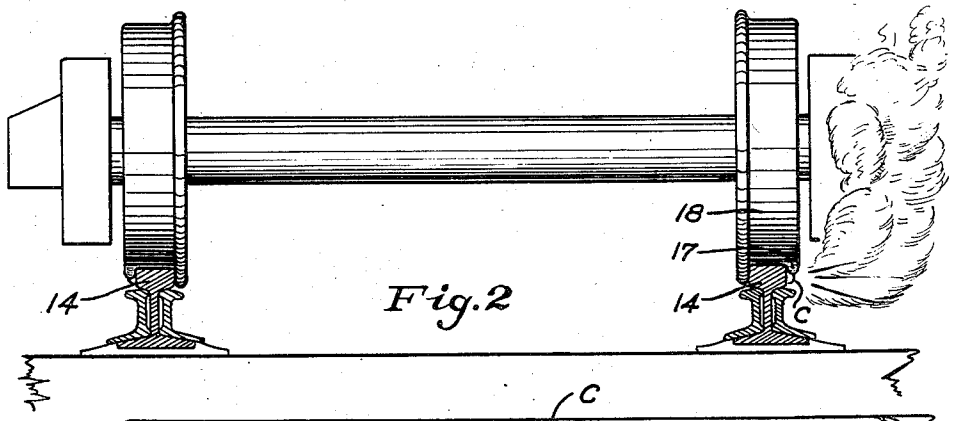


Fig. 2

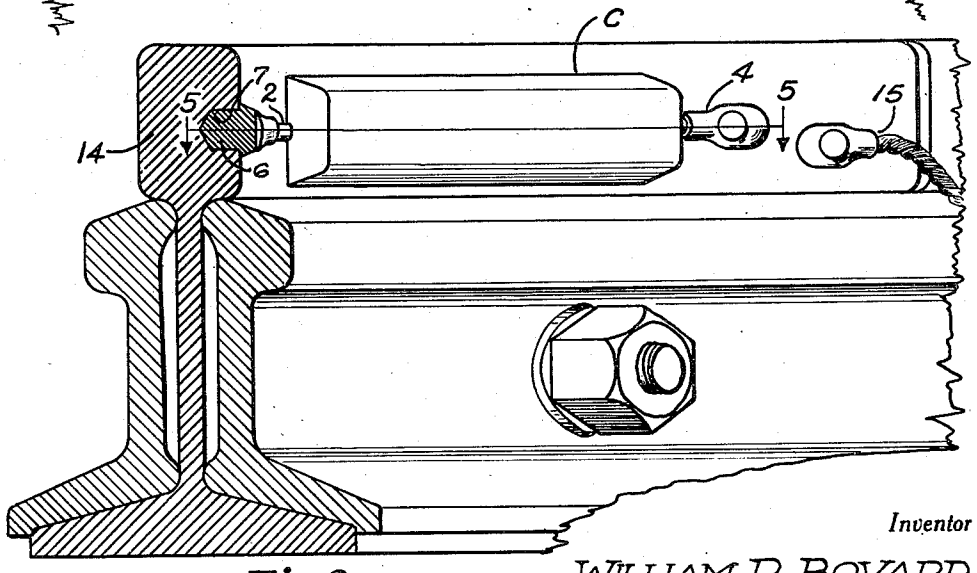


Fig. 3

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WARNING SIGNAL FOR RAILROADS

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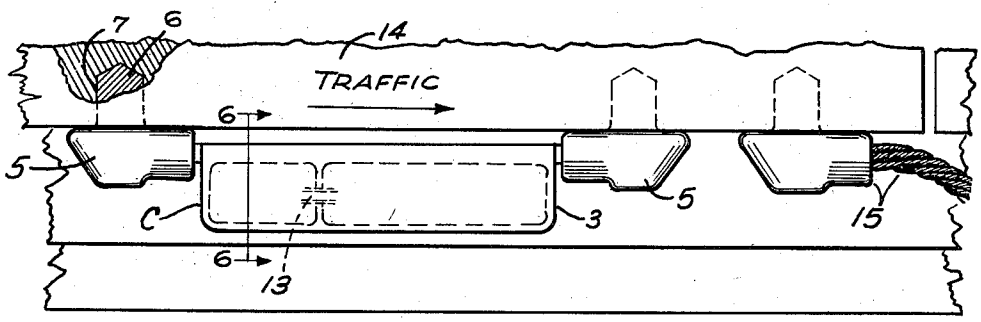


Fig. 4

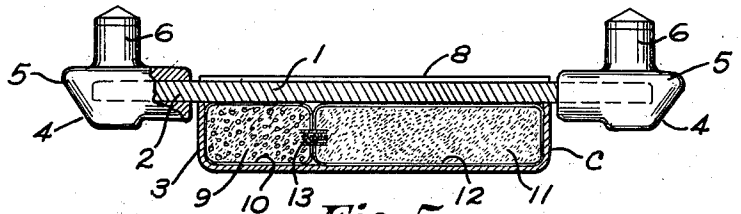


Fig. 5

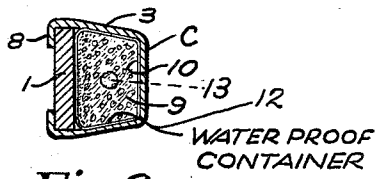


Fig. 6

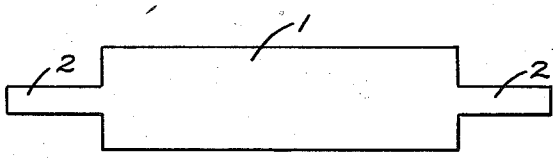


Fig. 7

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WARNING SIGNAL FOR RAILROADS

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9 Claims. (Cl. 246—169)

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This invention relates to signal devices and has particular reference to warning signals adapted for use on steam and electrified railroads.

In railroad operations much damage may result to the right-of-way and to rolling stock due to some element of the locomotive or cars becoming disarranged so as to infringe upon the normal clearance as for instance the clearance between the running surface of the rail and the ties.

This damage has been so extensive in many cases that railroads have installed elaborate wayside signals immediately ahead of interlockings and connected to detector means in adjacent interlocking towers to indicate dragging equipment on some car or cars of a passing train, thereby resulting in the stopping of the train and correction of the trouble possibly before serious damage to the track structure or signal system or derailment occurs.

Installations of the above nature require structures built into the track including underground wiring and line wires etc., hence are quite expensive and may cost between $5,000.00 and $6,000.00 per location.

A frequent cause of damage to elements of the track structure is misplaced or "dragging" brake beams that may slide along the outer face of the rail head thereby damaging conductor bonds, joint bolts and not infrequently the rolling stock on which the defective equipment is mounted due to striking road crossing structures, switches, frogs, etc.

Rail bonds provided for automatic signal circuits may be sheared or damaged on long lengths of track as the train moves along without any means of detecting trouble until derailment or, serious damage to track elements is noted.

Other causes of damage by "dragging equipment" is that of locked wheels, sliding on the rail so as to groove the wheel tread and produce a false outer flange projecting downward which may seriously damage rail head bonds through miles of territory without detection until much damage has been done.

One object of my invention is to provide a device which will give the train operators warning of dragging equipment, excessively worn sliding wheels, etc.

Another object of my invention is to provide a warning device which combines visual and audible signals to the train crew, workmen along the track, etc., of an abnormal condition of the train equipment.

Another object of my invention is to provide a device which is inexpensive and may be installed

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at suitable intervals along the track at a small expense to give the necessary warning to the train operators.

Still another object of my invention is to provide a warning signal which may be installed on the outer vertical face of the rail head and below its running surface.

A still further object of my invention is to provide a warning signal which will first give an audible warning and then a prolonged visual warning as by a colored flare and/or a cloud of dense smoke therefrom.

A still further object of my invention is to provide a waterproof receptacle adapted to be placed on the outer vertical face of the rail head at predetermined intervals and containing an explosive material subject to detonation as a result of impact from defective car equipment and a combustible material ignited by or when the explosive material is detonated and which will produce a prolonged flare and/or considerable smoke.

A further object of my invention is to provide a warning signal which may be applied to the track rails in the manner of rail bonds and which are safe against functioning until occasion demands same.

These and other objects I attain by means illustrated in the accompanying drawings, in which—

Fig. 1 shows a pair of car wheels on a pair of track rails mounted on a tie and a warning signal which has been set off by dragging car equipment.

Fig. 2 shows a pair of car wheels on a pair of track rails mounted on a tie and a warning signal which has been set off by a false flange on one wheel due to the wheel becoming locked and worn.

Fig. 3 shows a side view in perspective and section of a rail head with one of my improved warning signals secured thereto.

Fig. 4 shows a top view of a portion of a rail equipped with my improved warning signal.

Fig. 5 is a partial section of my invention taken on the line 5—5 of Fig. 3.

Fig. 6 is a section of my warning signal taken on the line 6—6 of Fig. 4.

Fig. 7 is a face view of the base member of my invention.

In the preferred embodiment of my invention I provide a case C comprising a base member 1 of relatively thick metal with projecting connecting lugs 2 and a cover 3 of relatively thin metal secured to the base member so as to form a moisture proof receptacle. The said parts are

formed preferably of non-ferrous or non-corrosive ferrous metal.

To each connecting lug is secured a terminal member 4 which may be of suitable metal such as steel or copper. The terminals are each provided with a head portion 5 and a stud 6. The heads are recessed to receive the lugs 2 which may be held by compressing the head upon the lug or by sweating the parts together. The terminal 4 as shown is a well known article of commerce but other suitable forms of terminals may be used. The terminal shown is adapted to have the stud 6 inserted in an opening 7. With this type of terminal the attachment to the rail is very secure but is quite easily removed by proper tools when it is desired to replace a signal which has functioned.

The cover 3 is shown with an edge or flange 8 turned under the base and this edge or flange extending around the cover may then be soldered to the base 1 or secured thereto by a plastic seal or other suitable construction or means employed to produce a moisture proof container. The cover may be formed of other materials such as a suitable plastic.

Within one end of the case C is a quantity of material 9 which is explosive by impact to give an audible signal to the train crew. This material may be that now used in railroad track torpedoes which are arranged to be applied to the running surface of the rail to be detonated by the wheel of the first passing car. This explosive material may be moulded into a cake of proper shape and size or the material held in a thin plastic or moisture proof container 10. If desirable a fulminating material may form a part of unit 9 to effect the detonation of the unit.

Within the balance of the case C is a "fusee" or colored light and smoke producing unit 11 including a moisture proof container 12. This unit is a moulded or formed package of proper shape and size and of such combustible materials as will continue to burn for a considerable time and give off smoke and a flame of suitable color, invariably red. This material used in the unit may be that now employed in the manufacture of flares which are standard on most railroads.

The explosive unit 9 may be formed of or contain dynamite or other detonating material suitable for the purpose while the flare unit 11 may contain a salt of strontium together with other elements to support combustion to produce a long burning red flare with smoke.

The explosive unit 9 is connected to the flare unit 11 by an ignition fuse 13 which upon detonation of unit 9 is ignited and in turn ignites the material of the flare unit 11. In making up the device the adjacent ends of the units 9 and 11 are punctured and the fuse 13 inserted.

To use my improved warning signal holes 7 are drilled in the outside face of the head 14 of the track rails using the same equipment as now used to drill holes for signal bonds 15 for connecting adjacent rail ends.

The holes 7 are preferably located far enough down from the rail tread and sufficiently shallow as to be substantially below and outside the active load bearing cross-section of the rail.

The signal is installed preferably on both rails at suitable intervals possibly four to the mile. The detonating end of the signal is placed toward the oncoming traffic as shown by the arrow in Fig. 4 so as to receive the impact of any misplaced equipment as shown.

In Fig. 1 a warning signal is shown as having been set off by a misplaced piece of equipment 16 indicated by dotted lines.

In Fig. 2 a warning signal is shown as having been set off by a false flange 17 as the result of set brakes producing a sliding of the wheel 18.

The warning signal may be installed on supports 19 secured to ties 20 along the track at other points than on the head of the rails as for instance between the rails where they will be impacted by out-of-place equipment moving between the rails or at other desirable points along the track.

When the signal is impacted as described, the unit 9 is detonated which tears open the cover 3 ignites the fuse 13 and allows air to the unit 11 to aid in support of its combustion.

I am aware that track torpedoes are used on the upper surface of a rail when occasion requires and detonated by the wheel of the first moving car passing over same, but this is not intended to and probably will not warn the train crew of a defective part of the equipment. I am also aware that flares are used giving off a colored flame and arranged to be held in the hand after ignition by the train man or arranged to be stood on the track between the rails.

I am not aware however of a device combining a detonating unit and a flare unit automatically ignited from the detonating unit and the detonating unit arranged to be automatically set off by a damaged part of a passing car and which is so constructed and arranged that it may be used as what may be termed a permanent part of the track or rail system and function as above set forth.

I am aware that other arrangements of the elements shown and described may be made and fall within the scope of my invention and the appended claims, therefore without limiting myself to the precise application of my invention as shown and described nor to the precise structure and arrangement of elements as shown and described, I claim:

1. In combination with a rail, a warning signal capable of being detonated and attached to the outer vertical face of the rail head so that the signal is contacted by the outer ungrooved portion of a tread of a wheel grooved by wear against a rail.

2. A warning signal formed with a sturdy base member, means at each end of the base member for rigidly attaching the same to the outer face of a railhead so as to be contacted by the outer ungrooved portion of a tread of a wheel grooved by wear against a rail, a flare unit fastened to the end of the base member and toward the other end of the base member a detonating unit adapted to be detonated by contact with said ungrooved portion of a wheel passing over the railhead.

3. A warning signal formed with a sturdy base member, means at each end of the base member for rigidly attaching the same to the outer vertical face of a railhead so as to be contacted by the outer ungrooved portion of a tread of a wheel grooved by wear against a rail, a flare unit rigidly fastened to one end of the base member, and a detonating unit rigidly fastened to the other end of the base member and adapted to be detonated by contact with said ungrooved portion of a wheel passing over the railhead, said flare unit and detonating unit being connected by a fuse.

4. A warning signal formed with a sturdy base

member of non-corrosive metal having a lug extending from each end thereof, a terminal fastened over each lug, each terminal having (1) a head portion and (2) a stud extending backwardly from the base member and adapted for engagement in a hole in the outer face of a railhead, flare-producing material in one moisture-proof container, and explosive material containing fulminating material in another moisture-proof container, said containers being fastened side-by-side to the front of the base member by a cover which rigidly supports the units with respect to the base member, the cover being of such composition that it will transmit to the second container impact produced by contact therewith of the outer ungrooved portion of a tread of a wheel grooved by wear against a rail.

5. In combination with the rail of a railroad track, a warning signal fastened to the outer face of the railhead by fastening means which includes a stud on the signal and a hole in the outer face of the railhead in which the stud is located.

6. An elongated warning signal with a stud located near each end of one face thereof, each stud being adapted for engagement in a hole in the outer face of a railhead so that the signal is contacted by the outer ungrooved portion of a tread of a wheel grooved by wear against a rail.

7. A warning signal which contains signaling means within itself and a cover adapted to transmit an impact to the interior of the signal with means in the signal to set off the signaling means whenever an impact is so transmitted, means for rigidly attaching the signal to a railhead just below its top to insure proper support thereof so that an impact on the cover imparted by the outer ungrooved portion of a tread of a wheel grooved by wear against a rail, will set off the signaling means with required certainty.

8. A railroad track and rigidly supported on the outside of each rail thereof just below the top of the railhead so as to be contacted by the outer ungrooved portion of a tread of a wheel grooved by wear against a rail, a signal device which comprises a detonating unit which makes sufficient noise to serve as a warning signal, and a flare unit which is adapted to be ignited from the detonating unit.

9. In combination with a one-way stretch of railroad track and rigidly fastened to the outside vertical face of a railhead thereof a warning signal which includes a flare unit and a detonating unit which makes sufficient noise to serve as a warning signal, the two units being arranged with the detonating unit nearest an oncoming train and just below the level of the top of the railhead so as to be contacted by the outer ungrooved portion of a tread of a wheel grooved by wear against a rail, the flare unit being adapted to be ignited from the detonating unit.

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