

(No Model.)

H. O. KING & F. HAMMOND.

AUTOMATIC RAILWAY SIGNAL CARRIER AND TORPEDO PLACER.

No. 387,520.

Patented Aug. 7, 1888.

Fig. 1.

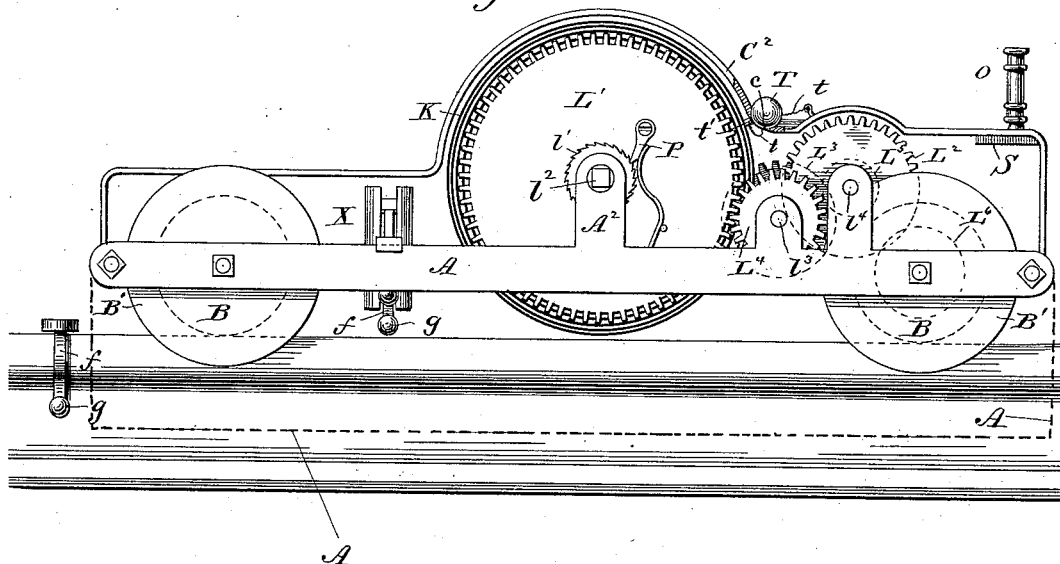


Fig. 2.

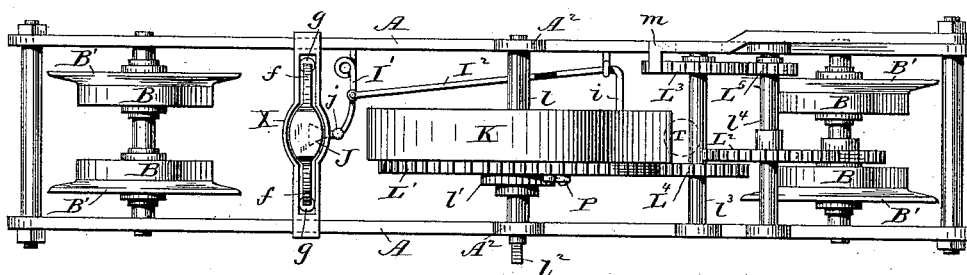
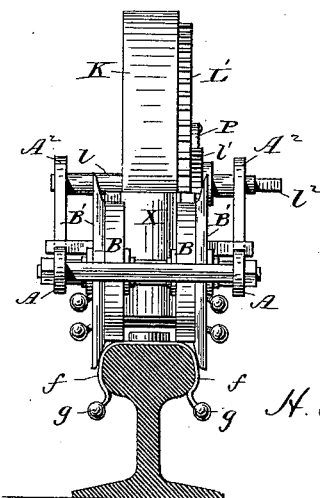


Fig. 3.



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# UNITED STATES PATENT OFFICE.

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AUTOMATIC RAILWAY SIGNAL-CARRIER AND TORPEDO-PLACER.

SPECIFICATION forming part of Letters Patent No. 387,520, dated August 7, 1888.

Application filed September 10, 1887. Serial No. 249,358. (No model.)

*To all whom it may concern:*

Be it known that we, HEZEKIAH O. KING and FRANK HAMMOND, citizens of the United States, residing at Greenville, in the county of Greenville and State of South Carolina, have invented certain new and useful Improvements in a combined Automatic Railway Signal and Message Carrier and Torpedo-Placer; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The object of our invention is to provide an automatic railway signal-carrying and torpedo-laying device adapted to run upon one of the ordinary rails by power stored within itself. Such a device may be charged with a visual signal, (such as a flag by day or a light at night,) and, also, if desired, with one or more torpedoes, and, if necessary, with a written message, and dispatched from a point of "danger" in the direction of an approaching train to warn the latter and give it time and space for stopping, and so avoiding a destructive or fatal accident.

The device comprises, essentially, wheels adapted in their arrangement for running upon a single railway-rail, guides (such as flanges upon the wheels or frame) adapted to fit a single rail and retain the wheels in place thereon, a balanced frame carried by the wheels, one or more visual or sonorous signal-carriers, and a motor carried by the frame and adapted to actuate the device. By preference the sonorous signal-carrier is a torpedo-receptacle and a torpedo-layer operating automatically at stated times to transfer torpedoes from said receptacle to the rail in position to be detonated by the train to be signaled. It is also very desirable to provide the device with a derailing-trip, which (the signaling device having proceeded the necessary distance) will automatically cause the machine to be thrown from the rail to avoid injury by the approaching train.

Our invention comprises also certain details of construction hereinafter particularly set forth.

We may here mention that the machine may be made very compact, so as to be easily stored

and handled. Ordinarily, each train should be provided with one, as loss of property and life could often be prevented by being able to dispatch such a signaling device from a delayed train to another which is rapidly approaching over what is supposed to be a clear track.

In order to make our invention more clearly understood, we have shown in the accompanying drawings a means for carrying it into effect.

In said drawings, Figure 1 is a side view of a signaling device embodying our invention. Fig. 2 is a plan view of the same. Fig. 3 is a rear view.

Referring to the drawings, B indicates a set of wheels arranged to run upon one of the ordinary railway-rails; B', guides which prevent the lateral displacement of the wheels from the rail, said guides consisting, in the construction shown, of deep flanges formed upon the outer edges of the wheels and spaced so as not to bind the rail too closely; and A, a frame mounted upon the journals of the wheels B. The diameter of the wheels and weight and arrangement of the frame should be such as to bring the center of gravity low and give as much stability as possible to the device. To this end the frame should be made comparatively wide and mounted upon the outer ends of the journals of the wheels, and in practice should hang as low as possible, substantially as shown in dotted lines in Fig. 1.

It will be seen that if the center of gravity of the whole structure, by duly proportioning the weight of its upper and of its lower portions, be brought below the top of the rail perfect stability is insured.

The device may be furnished with any suitable motor. We have shown, and shall hereinafter describe, the motor as consisting of a spring; but other means may be employed—such as an electric motor and storage-battery, the latter being charged by a dynamo before the device is placed on the train or in any other place where it may be needed, or both a spring and electric motor may be employed.

K denotes the spring referred to, applied in the usual manner to a shaft to turn the latter by its resilience. Said shaft is shown at L, 100

and is mounted in the frame A, bearings being provided by brackets A<sup>2</sup>, extending upward from said frame.

L' is a gear-wheel mounted loosely on shaft 5 l and provided with a pawl, P, which engages a ratchet-wheel, l', the latter being fast on said shaft. This arrangement permits the spring to be wound up without moving the wheel L', the driving-wheels, or the connecting-gearing 10 hereinafter described. The shaft is provided with a squared head, l', to which a crank-key may be applied to turn it in the proper direction to wind and compress the spring K.

L' is a pinion engaging with and adapted to 15 be operated by wheel L'. The pinion is carried by a shaft, l', mounted in the frame and provided with a gear-wheel, L<sup>2</sup>, of greater diameter than pinion L'. The former engages a second pinion, L<sup>3</sup>, carried by shaft l', which 20 latter is parallel with shaft l' and similarly mounted in the frame. It carries a gear-wheel, L<sup>2</sup>, which meshes with pinion L' on the axle of the forward pair of wheels, B, which thus become the driving-wheels of the device. By 25 means of the gearing just described it will be seen that the unwinding of the spring will be converted into many revolutions of the driving-wheels.

C<sup>2</sup> is a housing or protective covering extending over the motor and gearing to keep 30 the same from being displaced, broken, or injured.

O is a signal-carrier for visual signals. It consists, preferably, of a post having a socket 35 and adapted to carry either a flag by day or a lantern or rocket by night. The signal-carrier may, however, be constructed in various forms. A socket or hole in the housing or in some part of the frame would suffice. It 40 should be situated in the central vertical plane of the machine. After being wound up, the movement of the mechanism is controlled by a stop or latch, m, which is adapted to be engaged with one of the toothed wheels and 45 hold the same against the stress of the spring. Any other suitable form of stop may, however, be employed.

X is a receptacle for torpedoes to be laid 50 automatically by the device as signals to an approaching train. It is secured to the frame A by brackets E, and is situated in advance of at least one pair of the wheels B, which latter are so spaced as not to run upon the middle 55 of the torpedo to be used is explosive, and this portion, after the torpedo has been disengaged from the receptacle X and left upon the rail, occupies the said middle of the rail, where it is not struck by the said pair of the 60 wheels B.

The torpedoes are preferably formed with outwardly-extending malleable arms f, which are adapted to be compressed upon the sides 65 of the rail by the flanges of the said following pair of wheels. Besides extending outwardly, the arms f extend downward by means of a

bend at their outer ends. When, therefore, the arms are bent at their inner ends by the wheel-flanges their outer ends will be forced 70 under the rail, as shown in Fig. 3, so as to grasp it firmly. In order to give weight and stability to the torpedo and prevent its falling from the rail before it is clamped, we provide the ends of arms f with weights g. These also insure that when released it will drop 75 instantly from the receptacle X. The latter is of proper shape to receive and permit the exit of the body and arms of the torpedo.

To effect the disengagement of the torpedo or 80 torpedoes, there may be employed either the devices we have shown or any suitable well-known means. In the drawings the torpedoes are represented as being sustained in their receptacle X, which has no bottom, by a spring-slide, J, which passes under said receptacle. The slide 85 is carried by a spring rod or rods, I' I<sup>2</sup>, supported by the frame A. A projection, i, of said rod extends into the path of the expanding coils of spring K, so as to be moved by them successively, with the result that as the 90 device traverses the rail the spring-rod I' I<sup>2</sup> and slide J are withdrawn each time that projection i is so moved and torpedoes deposited at regular intervals—say sixty yards apart.

S is a receptacle for carrying a written mes- 95 sage.

The means for derailing the machine after its course has been run may obviously take many forms. One of the simplest is that illustrated. It consists of a weight connected with the ma- 100 chine by a cord or chain of sufficient length to permit the weight to strike the ground or ties, and so held upon the housing or frame as to be disengaged at a predetermined time by the operation of the motor. We have shown 105 such a weight at T and its connecting-cord at t. The weight is shown as mounted in a socket, c, in the housing and as being provided with a projection, t', which extends through the housing and into the path of the 110 expanding spring K. When the latter has nearly expanded to the full extent, it begins to bear upon the projection t' and gradually forces the weight T from its socket. The 115 weight being round, and the surface of the housing being so configured as to cause the weight to roll toward the outside of the railroad-track, said weight will fall to the ground, and, acting as a drag, derail the machine. By 120 providing that the weight shall roll and fall toward the outer side of the rail on which the machine is traveling we insure that the latter shall not be derailed toward the inner side and left on the track to be run over by the 125 train.

The operation of our invention is as follows: It being desired to signal and warn an approaching train—say from a delayed train on the same track—the device is taken from the 130 box, in which it will be kept ready with the motor charged, and placed upon the rail. The proper signal—say a red light—will be placed

upon the carrier O, and, if desired, a written message in the receptacle S. The weight T being in place, the motor is set in operation by making the proper connections if it is electric, or by releasing the spring if the latter character of motor be employed. In the construction shown the stop *m* is raised to permit such freedom of operation to the motor. The device immediately starts upon its errand with gradually-increasing speed. After the proper distance has been traversed, predetermined by the adjustment of rod I' I<sup>2</sup> relative to the motor or by the degree of tightness to which spring K is wound, the first torpedo is laid. After a certain number of revolutions another torpedo is laid, and so on, until the number necessary for the signal have been laid. The course of the machine having been nearly run, the derailing devices are set in operation. In the construction shown the spring K forces the weight T out of its socket, whence the latter falls upon the ground and causes the machine to leave the rail toward the side upon which the weight has fallen. Upon the approach and stoppage of the train which has been signaled, the machine will be picked up for further use, and the receptacle S will be opened to ascertain whether a verbal message has been sent.

In practice suitable adjustment of the slide J relative to the motor and of the derailer relative to the motor may be provided, in order that these mechanisms may operate at various distances from the point of departure, as may be desired. In the construction illustrated such time of operation is secured by winding up the spring K more or less tightly, with the result that the coils of the same will come in contact with the projection *i* at a later or earlier time. The slide J is also adjustable upon the rod I' by means of the set-screw *j*.

The torpedoes are spaced apart in the receptacle X by small blocks of wood, in order to insure that the slide J shall properly deliver the torpedoes one at a time, such spacing enabling the slide to spring back in time to catch and retain the torpedo next above the one released.

Having thus described our invention, what we claim, and desire to secure by Letters Patent of the United States, is—

1. In a railway signaling device, the combination of the balanced frame, the supporting and driving wheels arranged for a single rail, a motor connected with the driving-wheels to rotate the same, guides spaced to fit the sides of a single rail and retain the device upon the same, and means for signaling, substantially as described.

2. The combination of the balanced frame, the supporting and driving wheels, a motor connected with the driving-wheels to rotate the same automatically, guides spaced to fit and retain the device upon a single rail, a signaling device carried with said frame, and a derailing-trip operating automatically at a predetermined time, substantially as set forth.

3. The combination of the balanced frame, four supporting and driving wheels flanged upon their outer margins, a motor carried with the frame and connected with the wheels to automatically rotate them, and a signaling device carried with the frame, said flanged wheels being spaced to fit and retain the machine upon a single rail, substantially as set forth.

4. The combination of the balanced frame, the supporting and driving wheels, a motor carried by the frame and connected with the wheels to automatically propel the machine, guides spaced to fit and retain the device upon a single rail, a torpedo-receptacle carried by the frame, and a torpedo-placer operated automatically by the motor, substantially as set forth.

5. The combination, with the frame, the motor, and the supporting and driving wheels, spaced as described, of a torpedo having an explosive portion of a width less than the space between the treads of the wheels and malleable lateral arms having downward bends at their extremities, substantially as set forth.

6. The torpedo having a central explosive portion, two lateral malleable arms, and weights carried by said arms, substantially as set forth.

In testimony whereof we affix our signatures in the presence of two witnesses.

HEZEKIAH O. KING.  
FRANK HAMMOND.

Witnesses:

J. W. NORWOOD,  
J. D. HAMMETT.