

(No Model.)

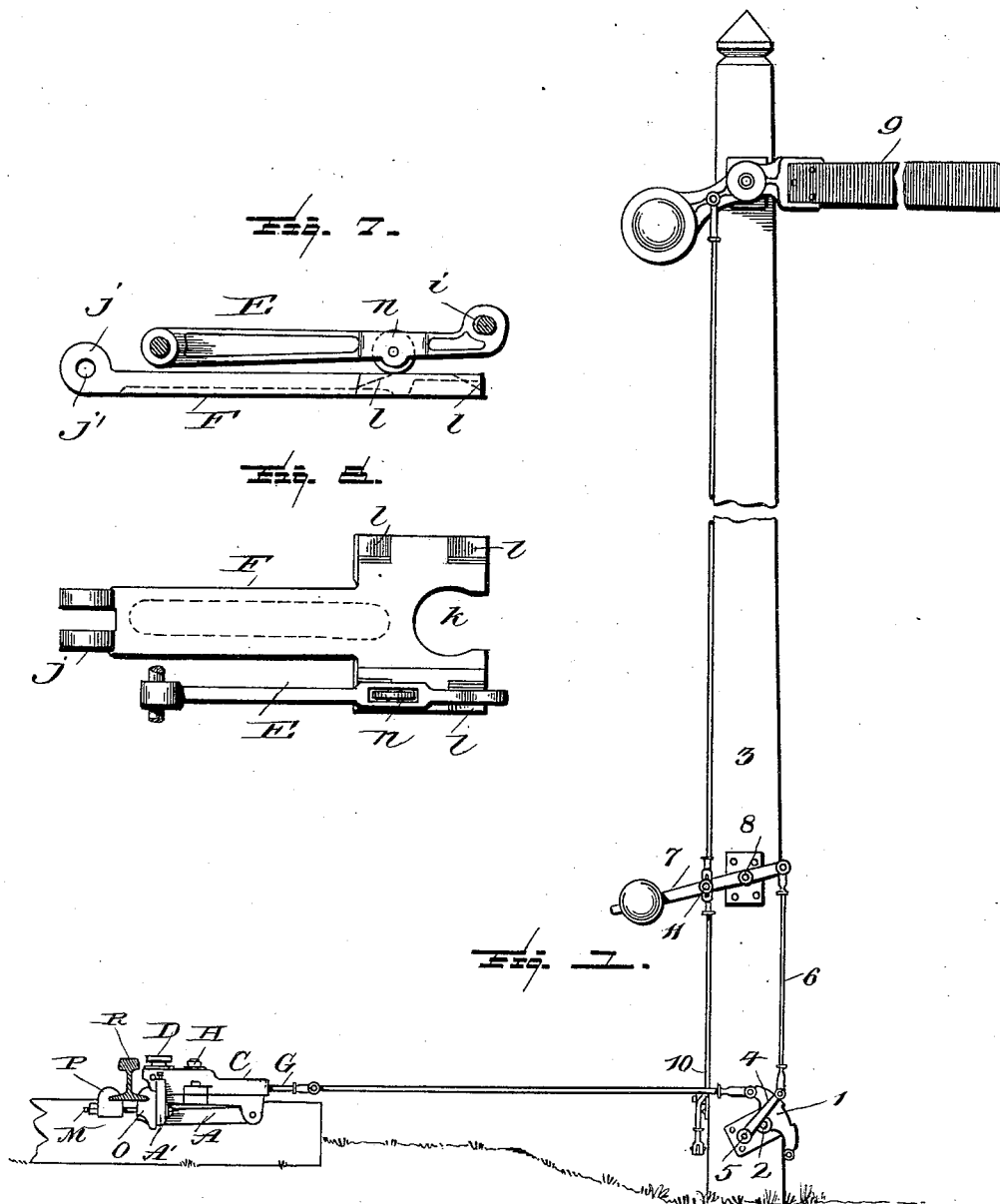
3 Sheets—Sheet 1.

H. F. CLARK.

TORPEDO SIGNAL FOR RAILWAYS.

No. 493,482.

Patented Mar. 14, 1893.



Witnesses

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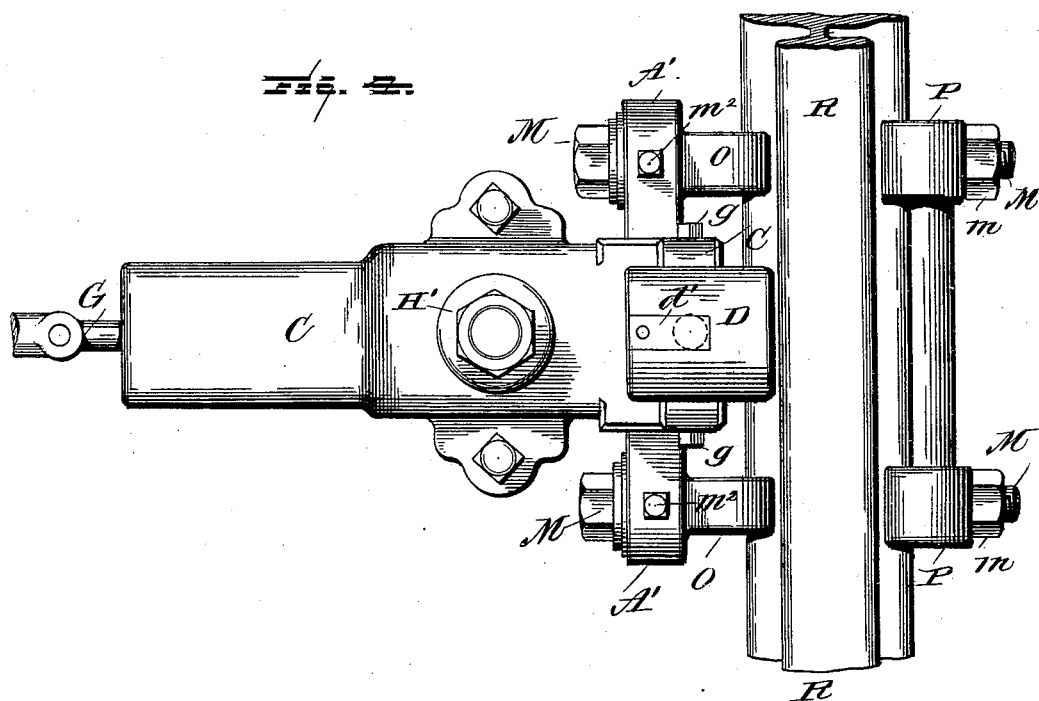
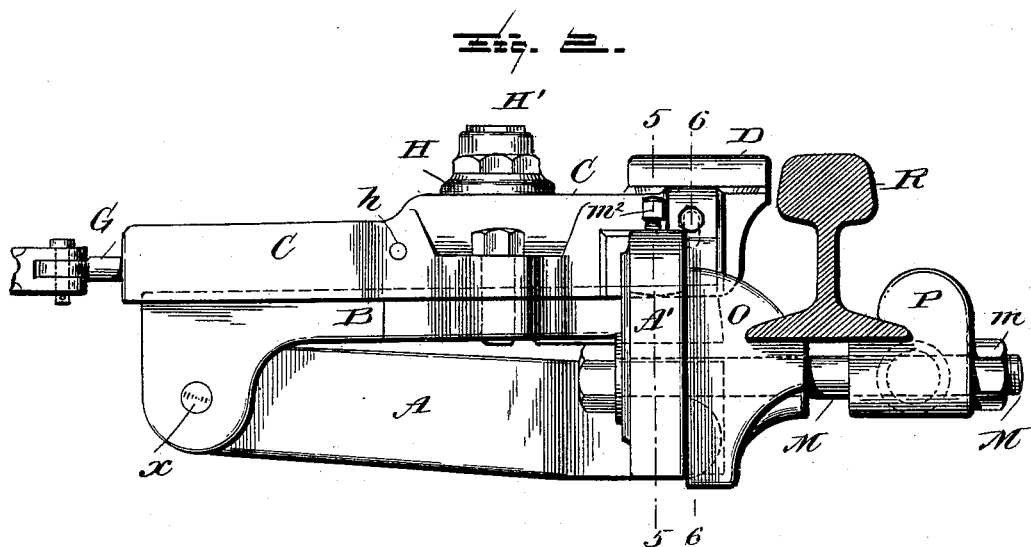
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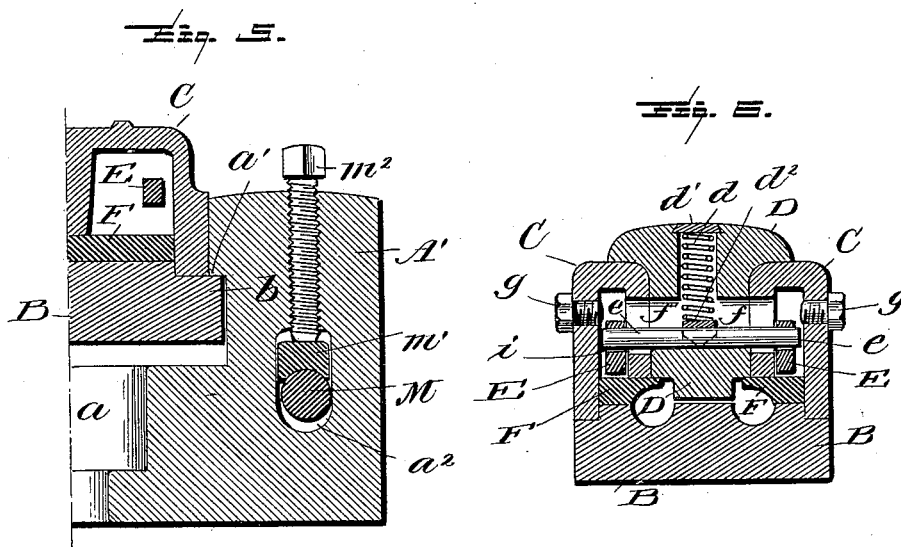
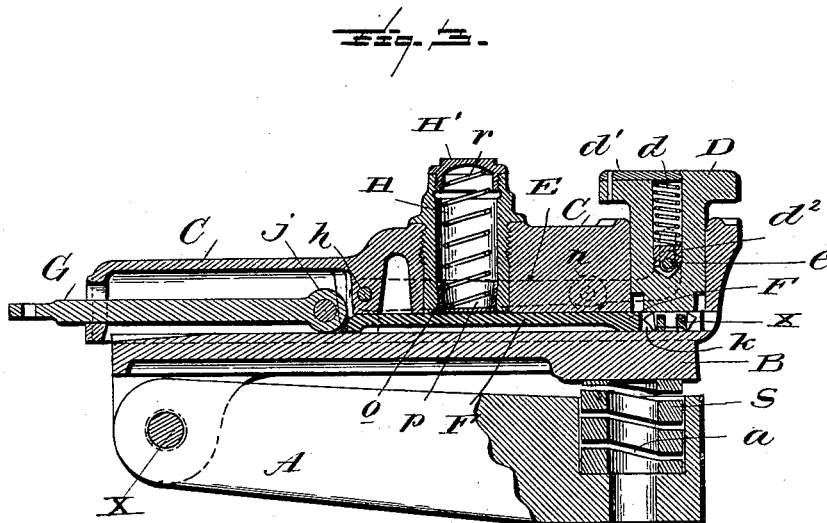
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UNITED STATES PATENT OFFICE.

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TORPEDO-SIGNAL FOR RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 493,482, dated March 14, 1893.

Application filed December 17, 1892. Serial No. 455,459. (No model.)

To all whom it may concern:

Be it known that I, HENRY F. CLARK, of Poughkeepsie, in the county of Dutchess and State of New York, have invented certain new and useful Improvements in Torpedo-Signals for Railways, of which the following is a specification.

My invention relates to a torpedo railway-signal of the kind described in T. G. Palmer's Letters Patent No. 310,717, of January 13, 1885, and in my own Letters Patent No. 330,562 of November 17, 1885. Like the apparatus of these Letters Patent, it is composed of an anvil which carries the magazine, torpedo slide, spring yielding exploder and levers for lifting the exploder to allow a torpedo to be placed beneath it, and which is hinged at its rear end to a bracket or hanger held by clips to the rail, a spring being interposed between the front end of the anvil and the hanger to permit the anvil and parts carried by it to be bodily depressed when occasion demands.

My improvements are designed to enhance the efficiency of the apparatus, and to better fit it for practical use, and they relate mainly to the joining and fitting together of the anvil and its supporting hanger; to the means for effecting the vertical adjustment of the apparatus relatively to the rail to which it is applied; and to the construction of the magazine. These and other features of the improvements can best be explained and understood by reference to the accompanying drawings in which—

Figure 1 is an elevation representing the complete apparatus in operative connection with a railway semaphore signal. Fig. 2 is a side elevation of the complete apparatus and means for attaching it to a rail. Fig. 3 is a longitudinal vertical central section of the apparatus. Fig. 4 is a plan of the same. Fig. 5 is an enlarged section of one half of the apparatus on line 5—5 Fig. 2. Fig. 6 is a section on line 6—6 Fig. 2, omitting the hanger. Fig. 7 is a plan of the slide and one of the exploder-lifting levers. Fig. 8 is a plan of the said slide and lever.

The whole torpedo signal apparatus proper is supported by the hanger A, provided at its front end with two large side lugs A' between which the front end of the apparatus fits and

can move up and down, as seen more clearly in Fig. 5 in which B is the anvil, and C is the housing which covers and incloses the working parts of the apparatus. The anvil at its rear end is hinged to the hanger at *x*, and at or near its front end it has lateral projections or flanges *b* which pass beneath shoulders *a'* on the lugs A'. The hanger is cored out at *a* to form a cavity in which is received a heavy spring S which is supported and kept in place vertically by the walls of the cavity. The spring at its upper end bears against the under face of the anvil, and, being under compression, forces the anvil up as far as permitted by the flanges *b* and shoulders *a'*, the spaces between the shoulders *a'* and the body of the hanger below forming recesses in which the anvil is received and can play up and down. In this position there is sufficient space between the bottom of the anvil and the hanger to allow the anvil and parts carried by it to be depressed bodily, when, for example, pressure is exerted upon the exploder more than sufficient to press it upon the anvil. The hole for the hinge between the hanger and anvil is not drilled in the hanger until the apparatus is fitted to the rail R, with which it is to be used, the object being to first adjust the signal apparatus proper (that is to say, the anvil and parts carried by it) to the proper distance from the rail. When this has been done the hole in the hanger is drilled, to coincide with the holes in the anvil, and the hinge pin is inserted. The joint *a', b*, between the anvil and hanger at the front end allows of this longitudinal movement of adjustment of the anvil relatively to the hanger—the apparatus in this respect differing from my previously patented apparatus in which the hanger and anvil are held together at their free ends by a vertical bolt secured to the anvil and passing down through a hole in the hanger.

The hanger is secured to the rail by clips O, P, and bolts M, in the same general way as illustrated in my Letters Patent No. 330,562, the bolts passing through vertical slots *a²* in the lugs A' this being to permit the apparatus as a whole to be raised or lowered, so that it may be vertically adjusted to suit any height of rail. There are two clips O on the side

next to the apparatus. The clip P, on the other side is preferably a single solid clip, of a length sufficient to receive both bolts M. The bolt holes in the clip P, are screw threaded, and the ends of the bolts are screw threaded so as to screw into and through these holes, jam nuts *m* being applied to their ends which project beyond the clip P so as to firmly secure the parts in place. For this purpose of providing for the ready and accurate vertical adjustment of the apparatus, I place over and upon the bolt M, in each slot *a*², a saddle *m'*, and I tap through each lug *A'*, a vertical screw threaded hole which meets the slot *a*², and contains a set screw *m*², that screws down upon the saddle. By means of these screws the whole apparatus can be vertically adjusted with the utmost nicety and accuracy.

I pass now to a description of the exploder and its actuating mechanism.

The exploder D is fitted to and adapted to move up and down in a vertical opening in the top of the housing; it has a hole bored into it from the top to receive the spring *d*, and a dovetail groove cut in it to receive the slide *d'* for closing the hole; and there is a cross pin *e*, placed beneath the spring with its ends passing through suitable vertical guide slots *f, f'* in the exploder and in the walls of the housing encircling the same—all substantially as described and illustrated in my Letters Patent No. 330,562. The pin is entered into place through holes in the sides of the housing closed by screw caps or plugs *g*; and between the spring *d* and the cross pin *d'* is interposed a saddle *d*².

E, E, are two lifting levers hinged at their rear ends on a pivot pin *h* which passes through the housing C, and has its ends upset on the outside of the latter to keep it in place; at their front ends the levers have slightly slotted holes *i* in which the ends of the cross pin *d'* are received, and in this way the levers and pin are compelled to move together. The levers are operated (as in my aforesaid patent) by the slide F, the details of which are shown plainly in Figs. 7 and 8. At its rear end it is provided with a jaw *j* and hole *j'* for attaching it to the connecting rod G. At its opposite end it is made broader or with lateral wings, to provide for the torpedo receiving opening *k*, and also to afford place for the inclines *l* by which the lifting levers are operated—the lifting levers being provided with friction rollers *n* which ride over these inclines when the torpedo slide is moved to and fro. The slide and connecting rod are first laid on the anvil, and then the housing with its contained parts is placed over them. The underside of the housing is cut away to afford proper clearance for the movements of the slide and connecting rod; and also to form a guide for the slide, the side edges of the enlarged front end of which fit against the interior of the housing. The inclines on the wings of the slide in conjunc-

tion with the friction rollers on the lifting levers, afford a certain and easy means of operating the latter with a minimum of friction.

The object of the exploder spring *d* (like that of the corresponding spring in my Letters Patent No. 330,562) is to prevent the crushing, bending or breaking of any of the parts should the machine be operated while a train is passing, or should a wheel strike the exploder at the instant the lifting rollers are passing over the raised portions of the slide F, between the inclines. In this event were it not for the spring *d* and the slots *f, f'* in which the cross pin works, something would be sure to break. As it is however the spring will be compressed, and the exploder will be depressed. The spring restores the exploder to normal as soon as the abnormal pressure is removed.

When the torpedo slide is in its rearmost position the opening *k* in its front end is directly under the open lower end of the magazine H. This magazine is of tubular form open from end to end, with its lower opening slightly less in diameter internally than the remainder of the magazine, and having an outwardly flaring or beveled lower edge *o*; and upon its outside it is provided with a thread, by which it may be screwed and held fast in the opening formed for it in the top of the housing. Within the magazine is the cupped plunger *p*, and the spring *r*, seated on the plunger, and compressed between the latter and the magazine cap or cover H', which is screwed into the top of the magazine.

In order to charge the machine, the magazine H is first unscrewed and removed from the housing: next the torpedoes are dropped into the hole in the housing left vacant by the magazine: and then the magazine is fitted to the hole and screwed down into place. In this operation the plunger will be forced up and the spring compressed—the torpedoes, by reason of the lower beveled edge of the magazine, readily centering themselves with respect to the magazine and being of such size that they will pass up through the reduced opening in the bottom of the latter. In this way the magazine is readily loaded with a charge of torpedoes, which by the spring and plunger are pressed down, so that the lowermost one will be fed with certainty to the slide F, when the opening *k*, in the latter is brought under the magazine. When the last torpedo is fed, the plunger *p*, is prevented from following it by reason of the reduced size of the opening in the bottom of the magazine, which is less in diameter than the plunger. By this arrangement not only is the feed of the torpedoes insured, but the torpedoes themselves are prevented from being turned or otherwise moved from their proper position in the magazine by the concussion consequent upon exploding a torpedo.

One way of connecting up the torpedo signal to a semaphore or visual signal is represented in Fig. 1. The connecting rod G, by

a suitable pipe connection is pinned to one end of a compensating cam lever 1, of the kind described in Treacy's patent No. 369,821 of September 13, 1887, pivoted at 2, to the signal post 3, and operating with its exterior cam surface in connection with a roller on the outer end of a lever 4, pivoted at 5 to the post, and joined at its outer end by a connecting rod 6, to the shorter arm of weighted lever 7, pivoted at 8, to the post. The rod leading from the signal operating lever in the cabin to the semaphore blade 9, is shown at 10; it is connected at 11, to the weighted arm of lever 7. In the position of parts shown in the figure the semaphore is at danger, and consequently the torpedo slide is in forward position with its contained torpedo (as at X, Fig. 3) under the exploder ready to be exploded by a passing train. If now it be desired to lower the semaphore blade to safety the operating rod is pushed up. This carries up the weighted arm of the lever, and consequently through the connection 6, moves the lever 4, downward with the effect of vibrating the compensating cam lever 1, in a direction to draw back the torpedo slide F, until the opening in its front end comes under the magazine. As soon as the signal goes again to danger, the slide will thereby be advanced to the position shown in Fig. 3.

Having now described my improvements, what I claim herein as new, and desire to secure by Letters Patent, is—

1. In a torpedo signal a hanger or anvil support, recessed for the passage of the free end of the anvil, in combination with a vibratory anvil mounted thereon, and extending into or through the recessed portion of the hanger, and a spring for holding the anvil against the top of the recessed portion of the hanger, substantially as and for the purposes set forth.

2. The combination of the hanger provided

with side lugs having shoulders upon their interior opposite faces, with the anvil hinged at the rear to the hanger, and passing at the front under the shoulders on the lugs, and the spring interposed between the hanger and the anvil, substantially as and for the purposes hereinbefore set forth.

3. The combination of the rail, the clips, the holding bolts, the hanger, provided with vertical slots for the passage of the bolts, and the saddles and set screws for adjusting the hanger vertically with relation to the clips, substantially as and for the purposes hereinbefore set forth.

4. In combination with the exploder its spring and cross pin, the reciprocating torpedo slide having side wings provided with the end inclines, and the lifting levers having friction rollers to engage the side wings of the slide, and provided with slotted holes for receiving the ends of the cross pin of the exploder, substantially as and for the purposes hereinbefore set forth.

5. In combination with the housing, the anvil and the slide, the removable magazine tube and the spring impelled follower or plunger contained therein, substantially as and for the purposes hereinbefore set forth.

6. The removable magazine tube formed at the end adjoining the torpedo slide, with a contracted opening having an outwardly beveled edge, and the plunger and its impelling spring contained in said magazine, in combination with the frame or casing in which said magazine is seated and the torpedo slide, substantially as and for the purposes hereinbefore set forth.

In testimony whereof I affix my signature in presence of two witnesses.

HENRY F. CLARK.

Witnesses:

CHAS. B. BRUNNER,
JOHN BRUNNER.