

C. N. STEEVENS.
DANGER SIGNAL FOR RAILWAYS.
APPLICATION FILED NOV. 7, 1911.

1,064,673.

Patented June 10, 1913.

3 SHEETS-SHEET 1.

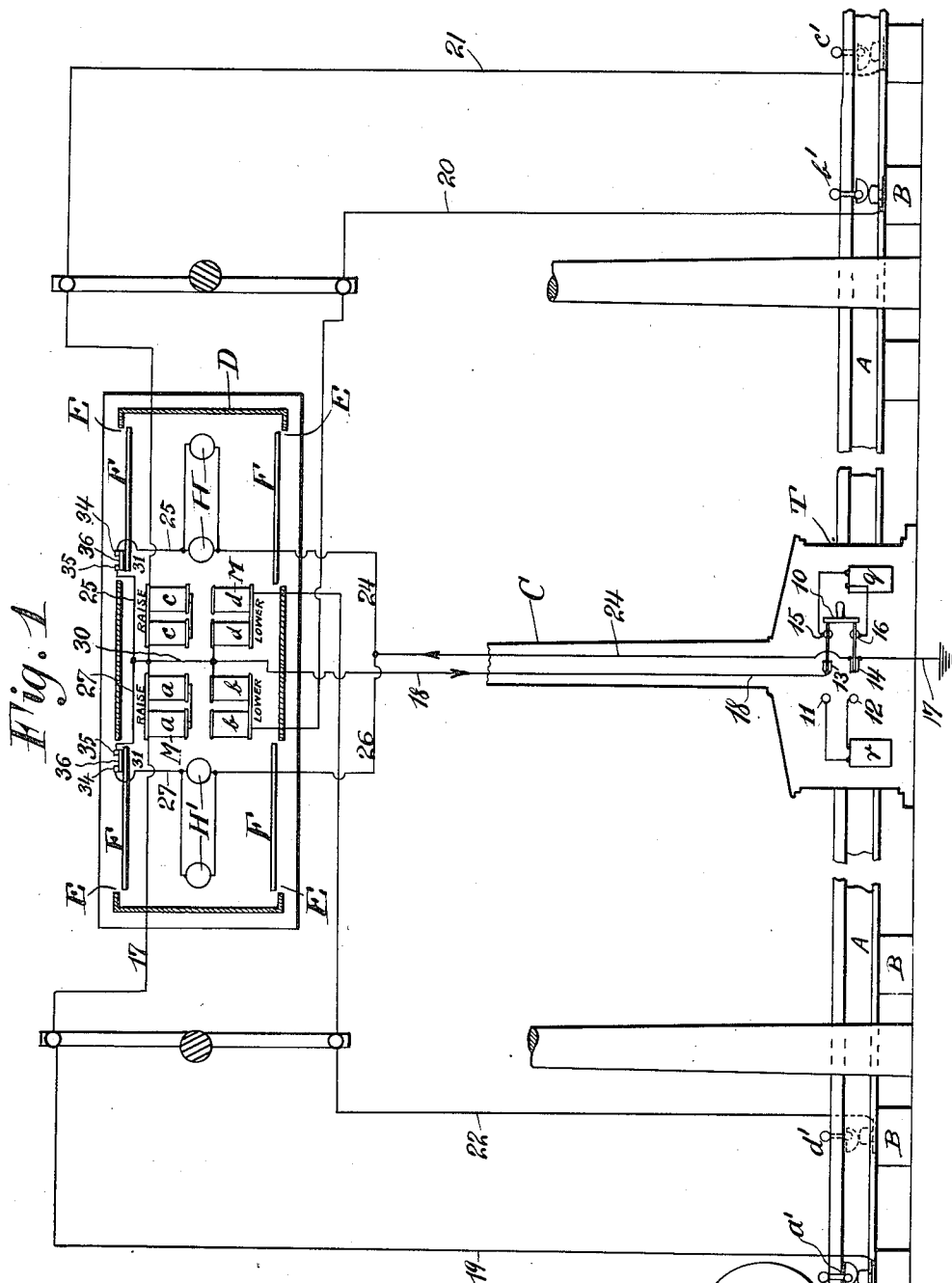


Fig. 1

WITNESSES

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3 SHEETS—SHEET 2.



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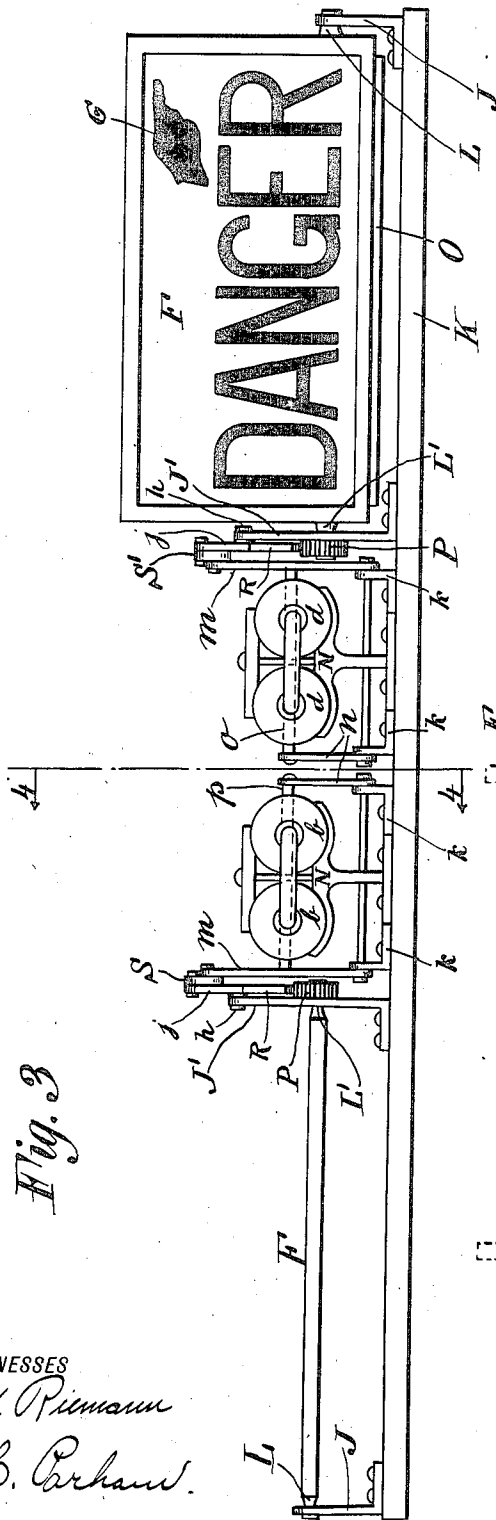


Fig. 3

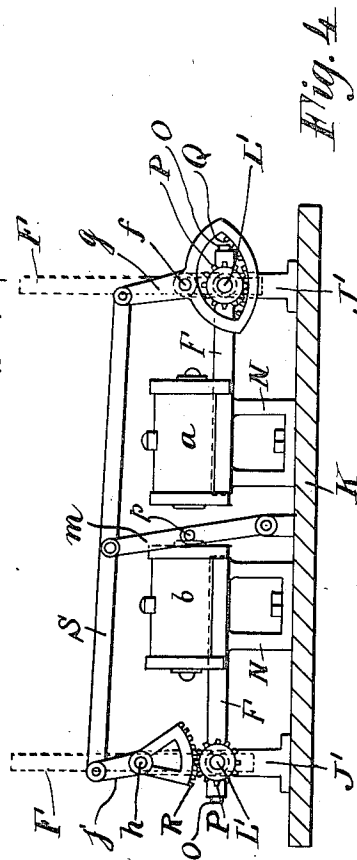


Fig. 4

WITNESSES
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UNITED STATES PATENT OFFICE.

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DANGER-SIGNAL FOR RAILWAYS.

1,064,673.

Specification of Letters Patent.

Patented June 10, 1913.

Application filed November 7, 1911. Serial No. 659,041.

To all whom it may concern:

Be it known that I, CLARENCE N. STEEVENS, a citizen of the United States, and a resident of Owego, Tioga county, New York, have invented certain new and useful Improvements in Danger-Signals for Railways, of which the following is a specification accompanied by drawings.

The invention relates to grade crossing danger signals for railways and the objects of the invention are to improve upon the construction and operation of such signals, enable the approach of a train from either direction to be indicated in advance by a sign, as the word "Danger," and a symbol such as a hand, pointing in the direction from which the train is coming, and obviate the use of a bell or other sounding signal, which cannot always be heard by the driver of a vehicle owing to the rumbling of the vehicle wheels or the load, or the noise of the engine of an automobile approaching the crossing.

My improved signal is so constructed and operated from a distance by the approaching train, that the signal shutters are automatically operated and brought into view on both sides of the signal head a sufficient time before the train reaches the crossing to give ample notice to the traveler using the highway. The shutters are preferably of one color, as white, and the letters may be of another color, as a transparent red, automatically illuminated at night from inside the signal head as a train approaches the crossing.

Further objects of the invention will hereinafter appear and to all of these ends the invention consists of the devices substantially as hereinafter fully described and claimed in this specification and shown in the accompanying drawings, in which—

Figure 1 is a diagrammatic view of apparatus for carrying out the invention, partly in broken elevation and partly in plan view, for convenience of illustration. Fig. 2 is an elevation of the signal stand. Fig. 3 is an enlarged detail side elevation of the signal head, with the casing removed. Fig. 4 is a transverse sectional elevation of Fig. 3 on the line 4—4, looking in the direction of the arrows and Fig. 5 is an enlarged detail broken side view partly in section of one of the track switches or tripping devices.

Referring to the drawings, the invention

is illustrated for simplicity in connection with a single track, although the principles of the invention may be applied to any number of tracks.

A indicates the rails, laid on the usual sleepers B, and C represents the signal post or stand adapted to be located at a highway or other grade crossing.

The signal head in the form of a casing D may be of any suitable construction and mounted on the stand C. The casing D preferably has four glass covered openings E, two in each side, one pair facing the highway in one direction and the other pair facing in the opposite direction. Within the casing D are arranged four shutters F, one for each opening, normally hidden from view, and provided with operating means electrically controlled from a distance by railway trains for bringing into view at the same time one shutter on each side of the casing to indicate the approach of a train. The two opposite shutters F at one end of the casing have hands G pointing in one direction along the track, while the two opposite shutters F at the other end of the casing have hands pointing in the opposite direction along the track. Thus a traveler has notice of the approaching train when approaching the crossing from either side. The electrical devices and connections are such that the two shutters F, which have been brought into view, are automatically restored to normal position after the train has passed beyond the crossing. Means are also provided for automatically energizing suitable electric lamps H and H' at night in the casing behind these shutters F, which are operated into danger position by the approaching train. The shutters F are preferably mounted within the casing to swing on horizontal longitudinal axes. Brackets J and J' are suitably secured to the base K of the casing at each side of the openings E and the shutters are provided with trunnions L and L' at one side of the longitudinal center, and pivoted in said brackets, so that the shutters may be rocked from the normal horizontal position to vertical position to indicate danger and returned to horizontal position. The shutters are also preferably weighted at the bottom to balance in any suitable manner as by the weights O, so that slight power is required to rock them on their trunnions.

Electroresponsive means are preferably

provided for operating the shutters, in this instance pairs of electro-magnets M being shown mounted within the casing. Four magnets pairs *a*, *b*, *c* and *d* are preferably mounted on brackets N with their axes transverse to the longitudinal axis of the casing. When either pair of magnets *a* or *c* are energized, a pair of shutters F at one end of the casing controlled by said magnets are moved into upright or danger position, and when either pair of magnets *b* or *d* are energized, the corresponding pair of shutters are moved into horizontal or normal position. The magnets *a* and *b* are controlled by a train moving in one direction, while the magnets *c* and *d* are controlled by a train passing in the other direction, suitable track switches or trippers *a'*, *b'*, *c'* and *d'* being provided in the track at a sufficient distance from the crossing and connected in circuit with the respective pairs of magnets *a*, *b*, *c* and *d*. For instance, let it be assumed that a train is approaching the crossing from the left as Fig. 1 is viewed as indicated by the wheels *e*. The track switches are so constructed that switch *a'* will be operated by the wheels to close the circuit of magnets *a*, but switch *d'* will not be thrown. The energizing of magnets *a* will operate the mechanism for moving the pair of shutters F at the left end of the casing D into upright positions showing the hands G pointing up the track to the left in the direction from which the train is coming. After the train has passed beyond the crossing, the switch or tripper *b'* will be operated to close the circuit of magnets *b* and restore the shutters to normal or horizontal position, while the switch *c'* will be passed over without being tripped. If the train approaches from the right as Fig. 1 is viewed, first the magnets *c* will be energized and then magnets *d*, and the shutters at the right hand end of the casing will be operated.

Any suitable mechanical means may be provided controlled by the magnets M for operating the shutters and in this instance pinions P are mounted on the longer trunnions L' at the inner ends of the shutters and means are provided for rotating said pinions in the proper directions to raise and lower the shutters. Two of the pinions on the shutters at one side of the casing D mesh with inwardly toothed segments Q pivoted at *f* on two of the longer brackets J' and provided with short upwardly extending arms *g*. The opposite pinions P at the other side of the casing mesh with the toothed segments R pivoted on the remaining longer brackets J' at *h* and provided with the short arms *j*. The arms *g* of segments Q are pivotally connected to the arms *j* of segments R by links S and S' extending transversely across the casing adjacent the inner ends of the shutters and between

the shutters and the magnets. Two sets of brackets *k* are mounted on the base K between the opposed inner ends of the magnets M and upright links *m* and *n* are pivoted to said brackets, extending upwardly between said magnets. Horizontal rods or bars *o* and *p* forming armatures are pivoted respectively to said links *m* and *n* and are adapted to be rocked on the said links according to the pair of magnets *a*, *b*, *c* or *d* energized. The bar *o* is connected to the link S and the bar *p* is connected to the link S' so that movement of the bars or armatures imparts movement to the segments Q and R and thus rotates the pinions P. In Fig. 4, the shutters F are shown down and the armature *o* has been attracted to the left. When armature *o* is attracted to the right, the shutters are raised.

The base of the stand C is preferably provided with a box or casing T containing a suitable source of electric power, as the storage batteries *q* and *r*, and a door *s* is provided for the box. The batteries are suitably connected in circuit with the pairs of magnets *a*, *b*, *c* and *d*, with the lamps H and H' and with the track switches *a'*, *b'*, *c'* and *d'*. The mechanical construction of the track switches or trippers is shown in detail in Fig. 5, in which *t* represents a lever pivoted at *u* to the web of the rail and provided with a roller *v* at its upper end and a cam *w* at its lower end. A socket or cup 2 of insulating material is mounted on a cross tie B underneath the lever *t* and a contact piece 3 is contained in the socket 2 and normally pressed upwardly by a suitable coiled spring 4, bearing underneath the shoulder 5 on said contact piece. The terminal of an electric conducting wire is inserted beneath the contact piece 3, so that a circuit will be completed between the rail and said wire, when the contact piece 3 is pressed down upon the wire. A cap 7 is provided over the socket 2, preferably having a central projection 8 adapted to bear upon the contact piece 3 and force it down when the lever *t* is rocked in the direction of the arrow 9 in Fig. 5, by the wheels of a train. Contact is not made through the switch when the lever *t* is rocked in the other direction. The switches are all substantially of the same construction.

A suitable hand switch 10 is preferably provided in the box T at the base of the signal stand C, controlling the contacts 11, 12, 13, 14, 15 and 16, included in the circuit of the batteries, trippers and magnet pairs.

One pole of storage battery *q* is connected to contact 16 and from thence through switch 10, to contact 14, which is grounded by wire 17, thus connecting the rails and one portion of the track switches *a'*, *b'*, *c'* and *d'* in circuit. The other pole of battery *q* is connected to contact 15, thence through

switch 10 to contact 13, to which is connected the common wire 18 leading to all the magnet pairs *a*, *b*, *c* and *d*. The track switches *a'*, *b'*, *c'* and *d'* are connected by wires 19, 20, 21 and 22 respectively with the magnet pairs *a*, *b*, *c*, and *d* and thence by the common wire 18 to the battery *q* when the switch 10 is in the position indicated in Fig. 1. The battery *r* is connected to the contacts 11 and 12 and the operation of the circuits for the magnet pairs is the same if the switch 10 is thrown over to include battery *r* instead of battery *q* in circuit. The lights *H* and *H'* are also connected in circuit with the batteries *q* and *r* and the object of the switch 10 is to enable one battery to be used while the other is being charged. The lights consume very little current and for this reason it is not necessary to cut out the lights in the day time, and no signal tender is necessary with my improved signal. The circuits of the lights are automatically closed by switches 23 and 31, to be described, included in the light circuits and operated by the raising of the shutters. A wire 24 is connected to the contact 14 and leads to the lamps *H*, which are connected in parallel, and a wire 25 connects the lamp circuit with the common junction 30 of the wires 19, 20, 21 and 22. A wire 26 is connected to wire 24 and leads to the lamps *H'*, which are connected by wire 27 with the common junction 30 of the said wires. Thus the lights are in shunt circuits with the magnets, and are connected directly to the batteries. Obviously, no light circuit can be energized until a shutter switch is closed.

The automatic switches 23 and 31 inserted in the circuits 27 and 25 from the lights respectively may be of any suitable character adapted to be operated to close the proper light circuits when one or the other pair of shutters is raised. As shown, two contacts 34 and 35 are provided on the cas-

ing D to which contacts the wire 25 is connected and an insulated switch blade 36 on the shutter completes the circuit between contacts 34 and 35 when the shutter is operated to danger position. Obviously if the signal is provided for a double track, it will indicate the approach of two trains from opposite directions at the same time.

I claim and desire to obtain by Letters Patent the following:

1. A danger signal adapted to be located at a crossing and indicate from either side the approach of trains coming from either direction, comprising a stand, a signal head, pairs of longitudinally extending movable signal members located at each end of the head, each of said members being mounted on inner and outer pivots, operative connections between the inner pivots of each pair, for simultaneously rocking the members of each pair on their pivots, and independent electroresponsive means for separately actuating the operative connections of each pair of signal members.

2. A danger signal adapted to be located at a crossing and indicate from either side the approach of trains coming from either direction, comprising a stand, a signal head, pairs of longitudinally extending movable signal shutters located at each end of the head, pivots at the inner and outer ends of said shutters, cross connections between the inner pivots of each pair of shutters, for simultaneously rocking the shutters of each pair on their pivots, and independent electroresponsive means for separately actuating the cross connections between the shutters of each pair.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses:

CLARENCE N. STEEVENS.

Witnesses:

H. B. TILHUY,

DON. C. LANE.