(No Model.)

M. W. PARRISH.

DANGER SIGNAL FOR RAILWAY CROSSINGS.

No. 522,670. Patented July 10, 1894.

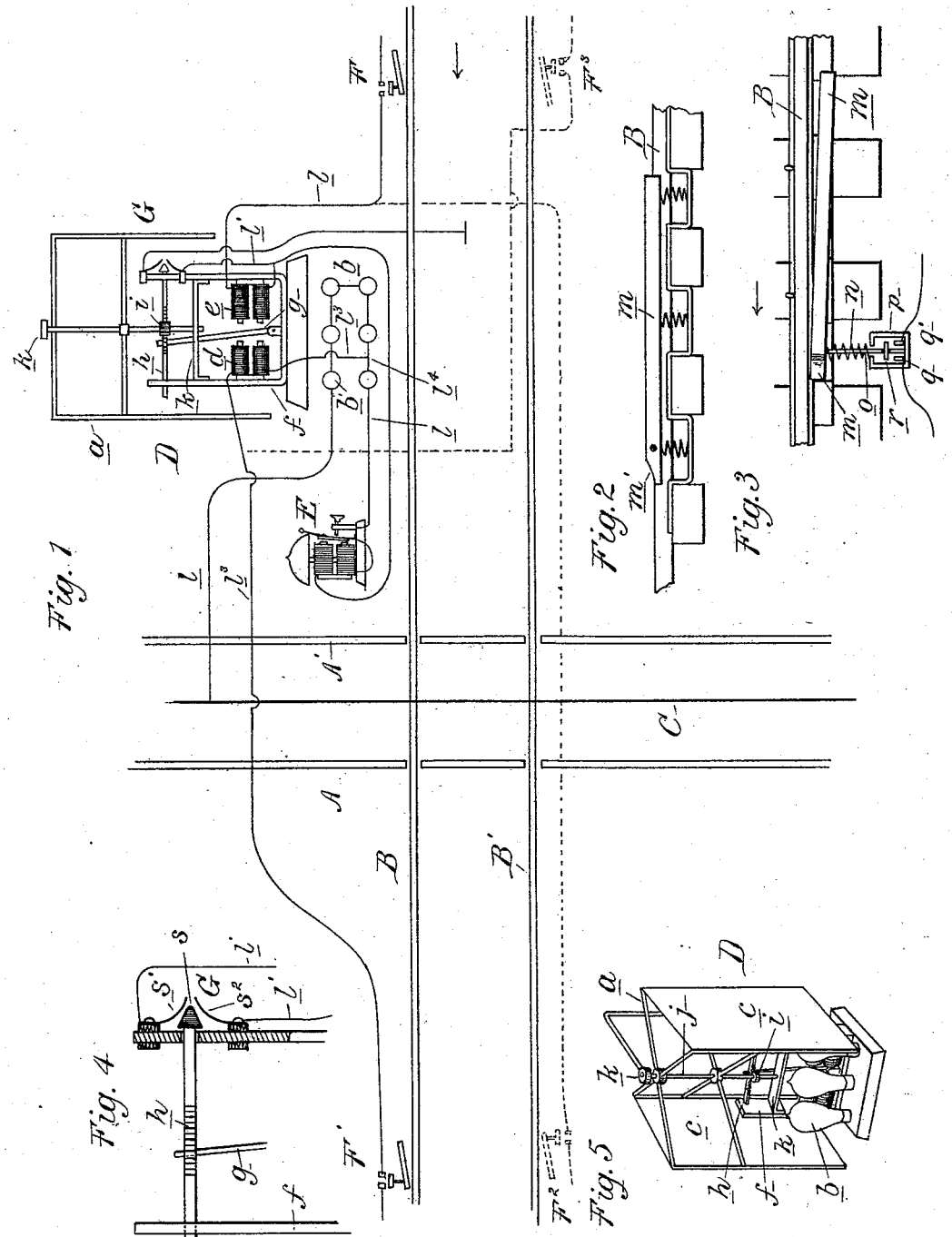

Fig. 1

Fig. 2

Fig. 3

Fig. 4

Fig. 5

Witnesses:
C. L. Crabb
M. B. Dogherty

Inventor:
Myron W. Parrish
By Thos. S. Spraguet Son
Atty's.

UNITED STATES PATENT OFFICE.

MYRON WELLS PARRISH, OF DETROIT, MICHIGAN.

DANGER-SIGNAL FOR RAILWAY-CROSSINGS.

SPECIFICATION forming part of Letters Patent No. 522,670, dated July 10, 1894.

Application filed October 30, 1893. Serial No. 489,452. (No model.)

To all whom it may concern:

Be it known that I, MYRON WELLS PARRISH, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Danger-Signals for Railway-Crossings, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention is especially intended for the crossing of an electric railway track with an ordinary railroad track, and the object of the invention is to set a danger signal for the electric railway by a railroad train approaching the crossing.

To this end my invention embodies the following devices: First, a danger signal consisting of lights, a target and an audible signal. Second, mechanism by means of which said signal is electrically actuated by a current diverted from the trolley wire. Third, contact making devices operated by a passing train to set the signal in operation upon the approach of a train to the crossing and afterward to restore the signal to its normal condition when it has passed the crossing.

My invention also consists in the peculiar construction of the signal itself, all as more fully hereinafter described and shown in the accompanying drawings, in which—

Figure 1 is a diagram plan view of a crossing of an electric railway track with an ordinary railway track with my danger signal applied to it. Fig. 2 is a side elevation and Fig. 3 is a plan view of the contact making device. Fig. 4 is an enlarged detail of the circuit closing device operated by the signal actuating mechanism. Fig. 5 is a detached perspective view of the signal target.

A A′ represents the track rails of the electric railway, B B′ the track-rails of an ordinary railroad crossing the same and C the trolley wire of the electric railway.

D is a danger signal consisting essentially of a swinging frame or target *a*, electric lamps *b* inclosed therein and two color screens *c c* forming two opposite sides of the frame and consisting preferably of transparent red curtains which are adapted in daylight to serve as a red target and at night to impart a red color to the light of the electric lamps.

The mechanism for actuating the danger signal consists of the electro-magnets *d* and *e* oppositely mounted upon a supporting frame *f* and having an armature *g* common to both pivotally secured between them, free to vibrate between the magnets. The frame *f* is preferably of iron and slidingly supports a rack bar *h* with which the free ends of the vibrating armature engage. The rack bar engages with a pinion *i* upon a shaft *j* which shaft revolves in fixed bearings *k k* and forms a central support for the signal D; all so arranged that the amplitude of motion of the armature in vibrating from one magnet to the other imparts one quarter of a revolution to the signal D.

The circuit of the magnet *e* comprises the connecting wire *l* which leads from the trolley wire C to the lamps *b* connecting them in series, thence to an electric bell E, thence to the magnet *e* and from there to a circuit closing device F adapted to be operated by the wheels of a train approaching the crossing and connecting the wire *l* with the ground (or with the return of the trolley wire). This circuit has a branch *l′* which leads around the magnet *e* to a circuit closing device G which is operated by the sliding bar *h* and which connects the branch *l′* with the ground (or return wire).

The circuit of the magnet *d* is formed by a connecting wire l^3 which branches off at l^4 from the connecting wire *l*, thence through the magnet *d* to a circuit closing device F′ operated by the wheels of a train after it has passed the crossing and which in the same manner as F connects the circuit of the magnet *d* with the ground (or with the return wire).

The circuit closing devices F F′ may be of any known construction, the one shown in the drawings consists of a bar *m* supported on springs slightly elevated above one of the rails B, with one end *m′* beveled off as shown and held laterally in contact against the rail by a spring *n*. A guide arm *o* projects laterally from the end *m′* of the bar into a casing or box *p* inclosing the fixed contacts *q q′*, and the movable contact *r* on the arm *o*, all arranged substantially as shown in Letters Patent No. 457,058, dated August 4, 1891.

The circuit closing device G is more fully shown in Fig. 4 wherein the sliding bar *h* car-

ries at one end the insulated contact piece s which is adapted to contact with the fixed contact springs s' s^2 which form the break in the connecting wire l'.

The parts being arranged and constructed as shown and described, they are intended to operate as follows: In the drawings, as shown in Fig. 1, the circuits of the magnets are open, and the position of the parts represents the normal condition of safety; the lights are out and the position of the target is such that the red curtains are in line with the track of the electric railway and therefore as the other two sides of the frame are open, there is no signal of any kind visible from this track on either side of the approach to the crossing. I purposely omit displaying a signal of any kind for indicating safety as two kinds of signals are liable to produce confusion. Now if a locomotive or train of cars approaches the crossing from the direction of the arrow shown in Fig. 1 the wheels will operate the circuit closing device F, which is supposed to be from one quarter to one half mile in advance of the crossing. The flange of the first wheel in entering between the bar m and the rail will push the end m' laterally outward and thereby close an electric circuit from the trolley wire by way of the connecting wire l through the lamps b, electric bell E, magnet e, circuit closing device F to the ground or return wire. A current will therefore be diverted from the trolley wire which will instantly light up the lamps, ring the electric bell, energize the magnet e and attract the armature. The armature in being moved by the magnet e from the normal position shown in the drawings carries the sliding bar h and its rack acting upon the pinion i imparts a quarter of a revolution to the shaft j, thereby turning the target so as to display the red curtain at right angles to the track of the electric railway and the lamps b being also in circuit, the device constitutes a day and night danger signal guarding the approach to the crossing on both sides of the track B. At the same time that the sliding of the bar h turns the frame a, it also actuates the circuit closing device G, thus while the circuit closing device F returns to its normal condition as soon as the train has passed over it, the current continues to flow over the branch l'. The signal is thus maintained after the train has once actuated the circuit closer F and it continues until the train actuates the circuit closing device F' on the other side of the crossing. As soon as the train reaches this device the circuit of the magnet d will be closed by way of the connecting wire l^3. In this circuit there are only five lamps, while the other circuit by way of the magnet e has six lamps besides the resistance of the electric bell and thus the current following the circuit of less resistance will flow by way of the magnet d, and in energizing said magnet will attract the armature g and acting upon the pinion i through the sliding rack bar h restore the signal to its normal condition, and the current ceases as soon as the train has passed the circuit closing device F'. A train passing in the opposite direction will not operate the circuit closing devices F F', as the flanges of the wheels in striking the beveled ends m' simply depress the bar and pass over.

To adapt the device for trains going in the opposite direction the circuit closing devices F F' have to be reversed and therefore by adding two more circuit closers as F^2 F^3, and connecting it with the circuits, as shown in dotted lines, the danger circuit is operated by trains going in either direction.

By utilizing a current diverted from the trolley wire to operate the signal I dispense with a separate source of electricity and in order to make this current available I place the lamps in series to form a suitable resistance for the current.

The electric alarm bell may be of any construction suitable to give a proper audible signal.

My device may be employed as a crossing signal for all kinds of railways where one has at all times a free right of way, and it is obvious that my signal may be made to operate for any number of tracks at the crossing.

What I claim as my invention is—

1. In a railroad crossing signal for electric railway, the combination with the trolley wire of the electric railway, of two electro-magnets in normally open circuits between the trolley wire and the ground or return circuit, circuit closing mechanism on opposite sides of the crossing, whereby the passage of a train successively closes and opens the circuit of one magnet and then of the other, an armature common to both magnets and adapted to be moved in opposite direction by said magnets, and a danger signal actuated by said armature and adapted to guard the approaches of the electric railway on either side of the crossing, substantially as described.

2. In a railroad crossing signal for electric railway, the combination with the trolley wire of the electric railway, of two electro-magnets in normally open branches of a circuit between the trolley wire and the ground or return circuit, circuit closing devices on opposite sides of the crossing whereby the passage of a train successively closes and opens the circuit, first through one magnet and then through the other, an armature adapted to be moved in opposite directions by said magnets and actuating the signal, a circuit closer controlled by the armature to close a short circuit of that magnet which actuates the signal to danger through a separate connection with the ground or return circuit, and signal lamps connected in series some in the circuit common to both magnets and the rest in that branch in which the magnet is contained which actuates the signal to danger, substantially as described.

3. In a railroad crossing signal for electric railway, the combination with the trolley wire

of the electric railway of two electro-magnets in normally open branches of a circuit between the trolley wire and the ground or return circuit, circuit closing devices as F F′ on opposite sides of the crossing whereby the passage of a train successively closes and opens the circuit first through the branch containing one magnet and then through the branch containing the other magnet, an armature adapted to be moved in opposite direction by said magnets, and a signal, comprising the swinging frame or target *a* having a central shaft upon which the signal is supported, the rack bar *h* and pinion *i* for swinging the frame by the movement of the armature, the lamps *b* inclosed by said frame, and some connected in series with the circuit of the magnet which turns the signal to danger and the rest in the circuit common to both magnets, the circuit closing device G controlled by the armature and adapted to connect the branch circuit of the magnet which turns the signal to danger with a ground or return signal and an electric bell in circuit with the lamps, substantially as described.

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

MYRON WELLS PARRISH.

Witnesses:
JAMES WHITTEMORE,
M. B. O'DOGHERTY.