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G. A. VICE.

AUTOMATIC SIGNAL APPARATUS FOR RAILWAY CROSSINGS.

(No Model.) (Application filed Oct. 31, 1899.)

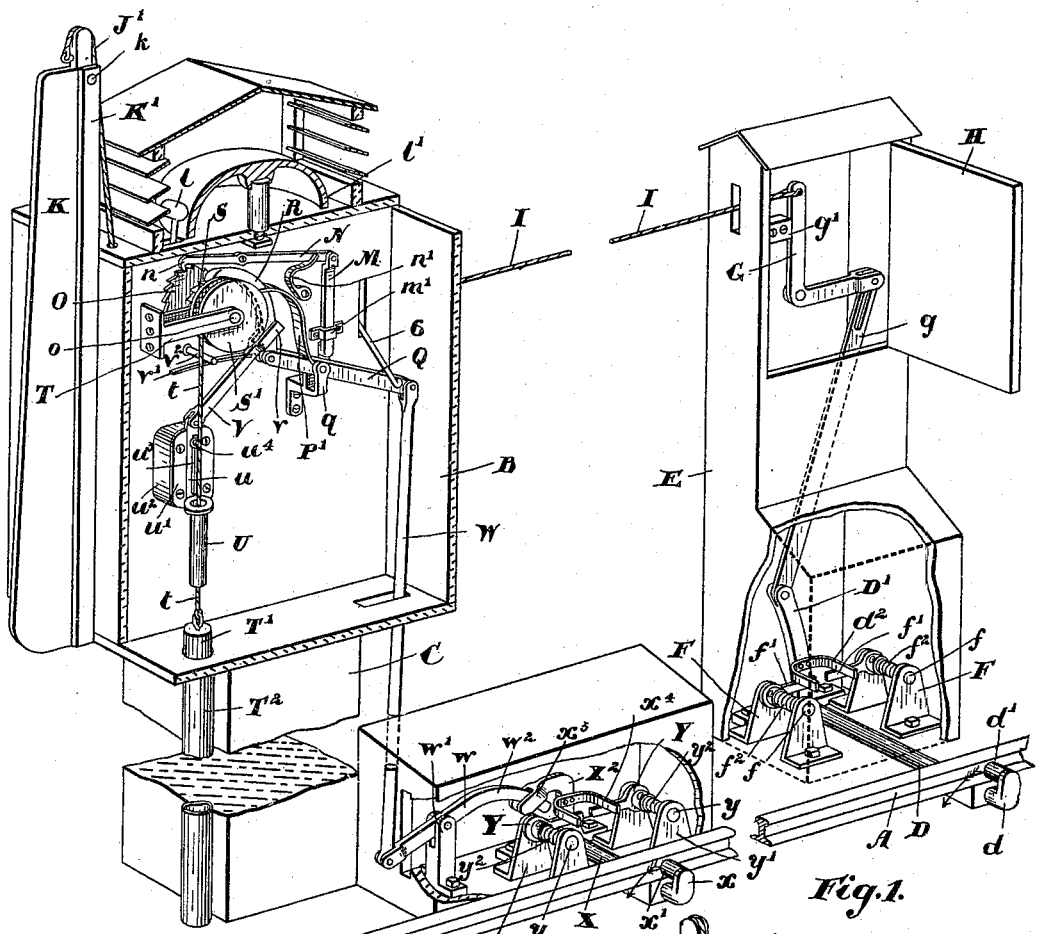

Fig. 1.

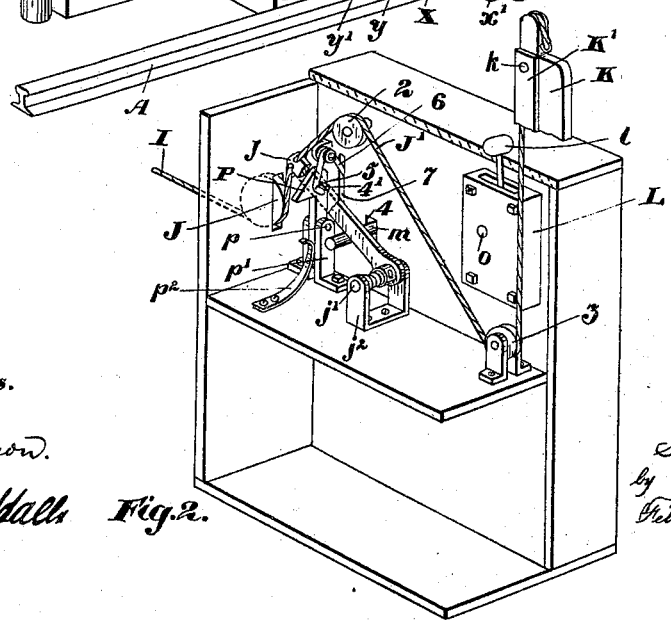

Fig. 2.

Witnesses.

A. Wenmison.

Wm. F. Wells

Inventor:

George A. Vice

by Fetherstonhaugh & Co.

Attys.

UNITED STATES PATENT OFFICE.

GEORGE AARON VICE, OF ST. MARYS, ONTARIO, CANADA, ASSIGNOR OF TWO-THIRDS TO WILLIAM JAMES GILPIN, OF SAME PLACE.

AUTOMATIC SIGNAL APPARATUS FOR RAILWAY-CROSSINGS.

SPECIFICATION forming part of Letters Patent No. 647,209, dated April 10, 1900.

Application filed October 31, 1899. Serial No. 735,434. (No model.)

To all whom it may concern:

Be it known that I, GEORGE AARON VICE, machinist, of the town of St. Marys, in the county of Perth, in the Province of Ontario, Canada, (whose post-office address is St. Marys, Ontario,) have invented certain new and useful Improvements in Automatic Signal Apparatus for Railway-Crossings, of which the following is a specification.

My invention relates to improvements in automatic signal apparatus for railway-crossings; and the object of the invention is to devise a simple, cheap, positive, effectual, and automatic apparatus whereby the passing of the train over the track as it approaches a crossing will produce an alarm and set a signal in proximity to the crossing and whereby the passing of the train at the crossing will rewind and set the alarm ready for the next train; and it consists, essentially, of a shaft extending underneath the rail at any desired distance along the track away from the crossing and provided with an arm extending up in proximity to the top of the rail, so as to be operated by the flange of the wheel as it strikes it and communicates motion to a set of mechanism connected by a wire or other cord to a set of mechanism located on a post in proximity to the crossing, a suitable shaft and arm being provided, also in proximity to the crossing, designed to be operated repeatedly by the passing of the wheels until the alarm is reset, the parts being constructed and arranged as hereinafter more particularly explained.

Figure 1 is a perspective view showing my two sets of mechanism partially broken away and in section and the rail intermediately broken away to give the idea of the distance between the two sets of mechanism. Fig. 2 is a back view of the signal mechanism.

In the drawings like letters and numerals of reference indicate corresponding parts in each figure.

A is the rail, B the box or casing containing the mechanism in proximity to the casing, and C the post on which the box is supported, such post being intermediately broken away to indicate that it may be placed at any desired height.

D is a shaft extending underneath the track and supported in suitable bearings and provided with an arm d, having preferably a roller d' pivoted in the top thereof and extending in proximity to the top of the rail, so that the flange of the wheel as it passes over it will tilt the arm in the direction indicated by the arrow.

E is a casing, which contains the signal-operating mechanism. The shaft D extends into the bottom of the casing and is provided at the inner end with an arm D'.

d^2 is a double arm extending outwardly from the arm D', to which it is suitably secured.

F F are two pairs of standards, in which are suitably journaled spindles f, provided with arms f', which extend underneath the arms d^2.

f^2 are spiral springs, which are attached at one end to the arm f' and at the other end to a suitable portion of the standard, the object being to exert a tendency to normally throw the arms upwardly.

G is a bell-crank connected by the bar g to the top of the arm D', and g' is a stop for the bell-crank. The bell-crank is located in the upper end of the signal-box, which is preferably provided with a door H.

I is a cord or rope which extends from the upper end of the bell-crank along the side of the track over suitable posts and rollers, such as is usually provided for semaphore purposes. The opposite end of the cord I extends around a pulley J into the casing B, where it is connected to an arm j, which is secured on a spindle j', supported in the bracket j^2. A spiral spring encircling the bracket j^2 and connected to the arm has a normal tendency to force such arm j upwardly. The arm j has connected to it a cord J', which passes over pulleys 2 and 3 and extends upwardly and over the top of the semaphore K, to which it is suitably connected. The semaphore K is pivoted on the pin k in the uprights K', attached to the side of the casing.

L is a casing containing a suitable train of gears designed to operate the hammer l, which extends up through the top of the casing and is designed to strike the signal-gong l'.

M is a bar having a pin m formed at the lower end. The pin m extends through a slot 4 in the casing into the back portion thereof and underneath the arm j. The bar M is supported in suitable guides m' and is pivotally connected at the top to a lever N, having a dog-shaped end n, which is designed to engage with the teeth of a ratchet-wheel O, secured on the arbor o, which is the main shaft or spindle of the train of gears. The lever N is held up at the long end by a suitable spring n'.

P is a hooked catch which is pivoted at p on the brackets p' and is held by a spring p^2, so as to normally force the upper hooked end outwardly. The hooked end has a pin 4′ extending laterally therefrom, which is normally engaged by the hooked end 5 of the bell-crank 6, which extends through a slot 7 in the middle wall of the box or casing over a lever Q, pivoted on the bracket q. (See Fig. 1.) The lever Q has a pawl R, pivoted on the short end, which is designed to engage with the ratchet-wheel S, attached to or forming part of the pulley or drum S′, which is secured on the arbor o, the outer end of which is supported by the bracket T. The pulley or drum S′ is designed to receive the cord t, which is wound upon it, as hereinafter described. The cord t extends through a sleeve U, which is attached to a bar u, suitably held in guideways u' in front of the block u^2. The bar u is provided with a slot u^3, and a pin u^4 extends through the slot into the block, so as to limit its movement. At the lower end of the cord t is affixed a weight T′, which has vertical movement within a suitable tube T^2, secured to the side of the post C. At the upper end of the bar u is pivoted an arm V, which has a forked upper end v straddling and resting against the pawl R. A spring v', extending into a notch in the arm V and pressing against a pin v^2, serves to hold the arm V against the pawl R.

The lower end of the lever Q is connected by a rod W to a lever w, suitably pivoted on the standard w' and provided with an arc-shaped end w^2.

X is a shaft extending under the rail and provided with an arm x, having preferably a roller x' journaled in the end thereof in proximity to the top or tread of the rail. The roller x' is designed to be operated by the flange of the wheel. The shaft X has an arm X^2 at its inner end with a forked end x^3, which entends over the arc-shaped end w^2 of the lever W.

x^4 x^4 is a double arm secured to the arm X^2 and extending over the arms Y Y, secured to the spindles y, journaled in the standards y'.

y^2 are springs encircling the spindles y and connected to the standards at one end and to the arms Y at the opposite end, such springs being designed to exert an upward pressure upon the ends of the arms Y, so as to cause them to maintain a like pressure upon the arms x^4.

Having now described the principal parts involved in my invention, I shall briefly describe its operation.

As the train approaches the crossing the front wheel of the bogie-truck will strike the roller d', thereby turning the shaft D and operating through the arm D′, bar g, bell-crank G, and cord I the arm j, so as to cause it to descend and press upon the pin m forming part of the bar M, thereby throwing the pawl-lever N upwardly and releasing the wheel O. As the arm j is thrown downwardly it passes the hook at the top of the catch P, and for this reason will maintain the pawl-lever disengaged with the wheel. As a result the weight T′ will through the cord t and drum S′ cause the train of gears to operate to cause a repeated action of the hammer l upon the bell. This striking of the bell will necessarily be continued until the weight T′ reaches the bottom of the tube T^2. The roller d' is always restored to its normal position after each wheel passes over it by means of the construction hereinbefore described in reference to the arms d^2 d^2, arms f' f', and springs f^2 f^2. It will thus be seen that the alarm at a crossing continues for some time. At the period that the arm j is drawn down to give the alarm the semaphore K is also raised through the cord, as hereinbefore described. When the train arrives in proximity to the crossing, the first wheel of the bogie-truck will strike the roller x', thereby tilting the shaft X in its journal and raising the rod W and lever Q, so as to force upwardly the crank-arm 6 and draw the hooked catch P from over the arm j, whereby the spring-pressed arm j will be forced upwardly and release the pin m, which will cause the bar M to ascend and the lever-pawl N to engage with the ratchet-wheel. As each wheel passes over the roller x' the lever Q will be operated, and as the pawl R is attached to the lever Q it will be seen that the pawl R will be simultaneously operated step by step, so as to bring around the ratchet-wheel S, and consequently the drum S′, and wind up the weight T′. When the weight is fully wound up and reaches the tube U, it will force the tube and bar u, attached to it, upwardly, consequently forcing the arm V against the pawl R, thus throwing it out of engagement with the ratchet-wheel S, and thereby preventing any tendency of the remaining wheels of the train operating upon the roller X′ so as to overwind the weight T′. It will be noticed that the pawl R is held in position by the spring P′, fitted into the pawl and lever Q.

From this description it will be seen that a sufficient alarm is provided to warn people at the crossing that they must not pass over the track. As soon as the train reaches the crossing the alarm is then unnecessary and the alarm mechanism is rewound in the manner hereinbefore described.

Although I describe my signal apparatus as

applied to railway-crossings, it will of course be understood that it might be employed with equal facility in various other places where an alarm is required.

It will be seen from the construction of my apparatus that the wheels passing over the arms *d* and *x* will only operate the mechanism in the one direction—viz., that indicated by arrow. When the wheels are passing over the arm in the opposite direction, the mechanism will not be operated, as the arm x^3 will be drawn away from the lever W and the slot at the upper end of the bar *g* will, on account of the arm moving in the reverse direction to what has been heretofore described, not permit of the movement of the bell-crank G.

What I claim as my invention is—

1. The combination with a suitable signal device located at the crossing, of a shaft extending underneath the rail and provided with a crank on the end thereof designed to be operated by the wheels of the car, the standards, the spring-actuated arms held on the spindles in the standards, the arm on the end of the shaft provided with the arms overhanging the spring-pressed arms, the bell-crank suitably supported, the bar connecting the bell-crank to the arm on the end of the shaft, and the cord connecting the opposite end of the bell-crank to the operating mechanism of the signal apparatus at the crossing as and for the purpose specified.

2. The combination with the shaft and the crank formed at the end thereof designed to be operated by the wheel, the cord extending to the signal apparatus, suitable intermediate mechanism between the cord and the shaft for pulling upon the cord upon the depression of the crank upon the end of the shaft, the spring-held arm in the signal box or casing to which the operating-cord is connected, the semaphore suitably pivoted in the casing and the cord operatively connecting the spring-pressed arm to the semaphore as and for the purpose specified.

3. The combination with the shaft and the crank formed at the end thereof designed to be operated by the wheel, the cord extending to the signal apparatus, suitable intermediate mechanism between the cord and the shaft for pulling upon the cord upon the depression of the crank upon the end of the shaft, the spring-held arm in the signal box or casing to which the operating-cord is connected, the spring-catch designed to overhang the arm when it is brought down, the bar provided with a pin extending underneath the arm, the pawl-lever pivotally connected to the top of the bar, the train of gear and hammer and bell, the ratchet-wheel secured on the end of the main arbor of the train of gear and co-acting with the pawl, the drum and the cord and weight all arranged as and for the purpose specified.

4. The combination with the train of gear, hammer and bell and the spring-pressed arm actuated through the operating-cord, the pin and bar and pawl-lever and the ratchet-wheel secured on the arbor of the gear mechanism, the spring-pressed catch designed to overhang the lever when the alarm is being operated, the drum, cord and weight on the arbor, and ratchet-wheel connected to the drum, of a pawl designed to operate the ratchet-wheel of the drum, the lever to which it is connected, the bell-crank arm provided with a hooked end extending over a pin on the spring-actuated catch coacting with the spring-actuated arm, means operated from the wheels of the passing train for throwing the lever upwardly, so as to operate the bell-crank and release the spring-arm from the spring-actuated catch as and for the purpose specified.

5. The combination with the train of gear, hammer and bell and the spring-pressed arm actuated through the operating-cord, the pin and bar and pawl-lever and the ratchet-wheel secured on the arbor of the gear mechanism, the spring-pressed catch designed to overhang the lever when the alarm is being operated, the drum, cord and weight on the arbor, and ratchet-wheel connected to the drum, of a pawl designed to operate the ratchet-wheel of the drum and the lever to which it is connected, the bell-crank arm provided with a hooked end extending over a pin on the spring-actuated catch coacting with the spring-actuated arm, the shaft extending under the rail provided with an end arm located in proximity to the side of the top of the rail, the arm on the end of the shaft provided with a double arm, the standards and the spring-held arms on the spindles on the standards exerting a normal upward pressure on the double arms on the arm on the end of the shaft, the lever extending under the end of the arm on the end of the shaft and the rod connecting such lever to the lever in the casing as and for the purpose specified.

6. The combination with the train of gear and hammer and bell and main arbor and the drum and ratchet-wheel on the same and the cord and weight and the lever Q and pawl R and means for operating them, of a spring-held push-arm, a vertically-adjustable bar to which the same is connected at the top and a tube connected to the vertically-adjustable bar through which the cord of the weight extends as and for the purpose specified.

GEORGE AARON VICE.

Witnesses:
B. BOYD,
A. H. MCADAM.