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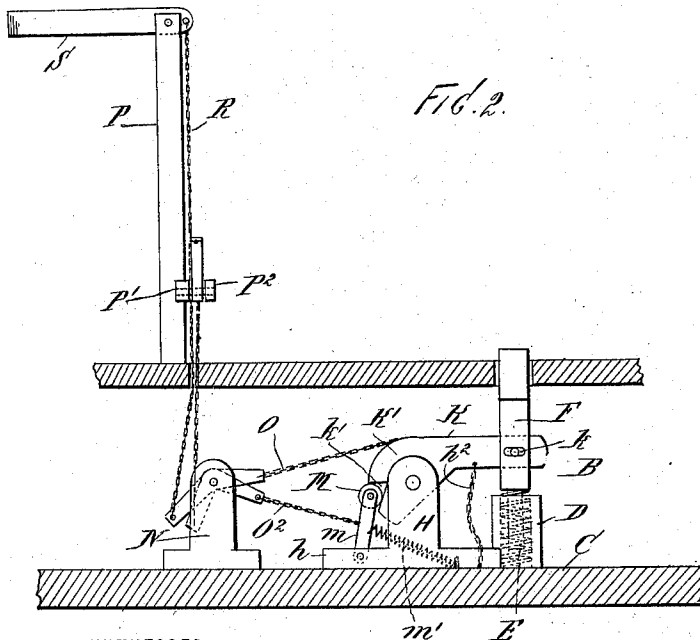
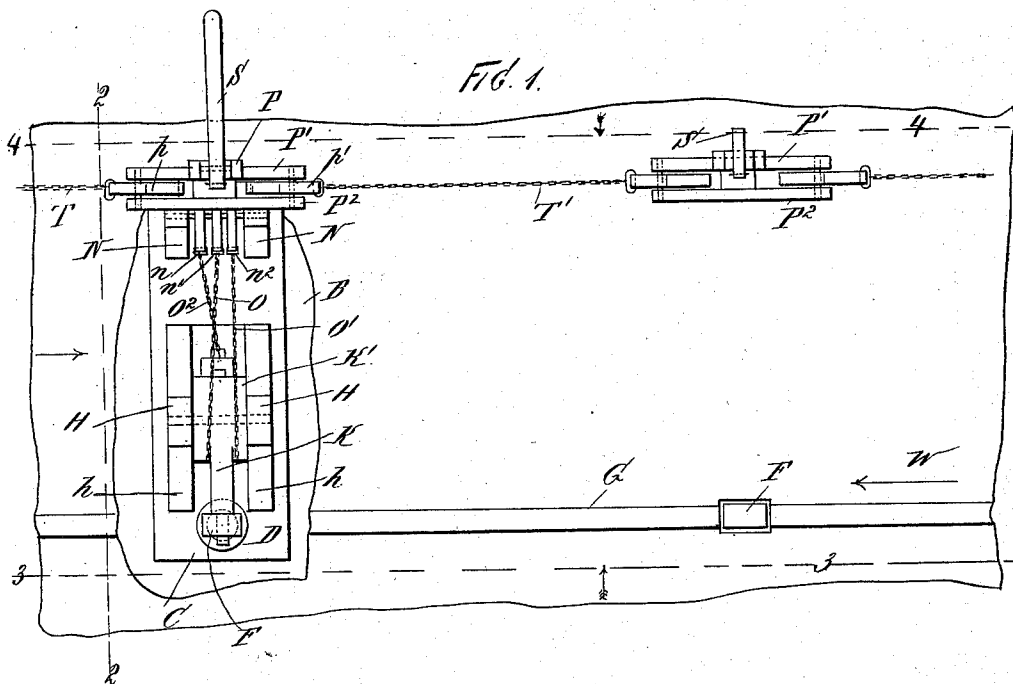
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F. R. PAGE.

AUTOMATIC BLOCK SIGNAL SYSTEM FOR RAILWAYS.

No. 558,097.

Patented Apr. 14, 1896.



WITNESSES:

John Buckler
L. M. Muller.

INVENTOR

Frank R. Page,

BY

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ATTORNEYS

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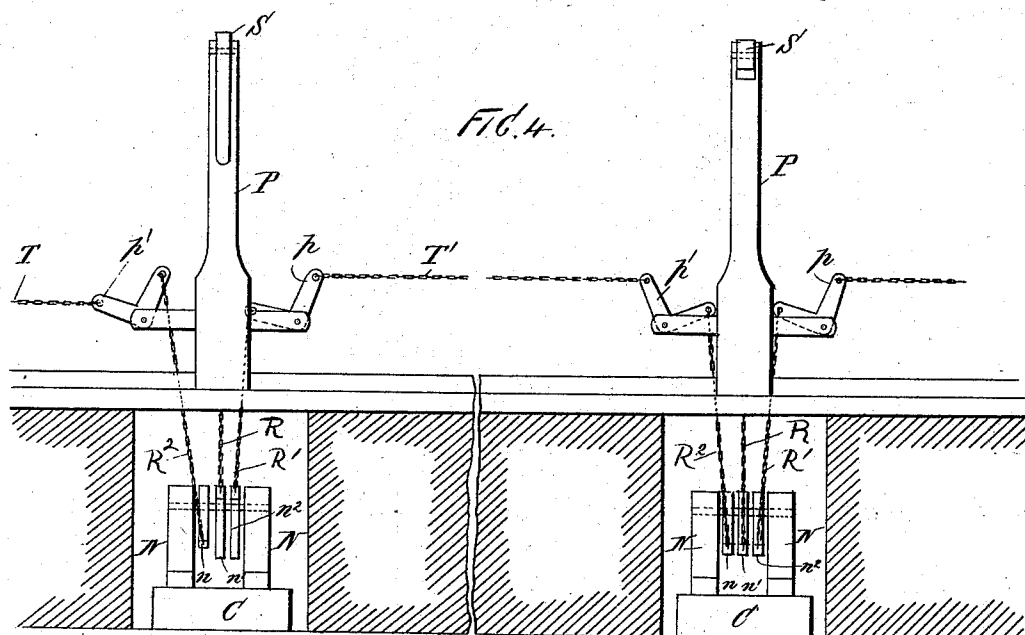
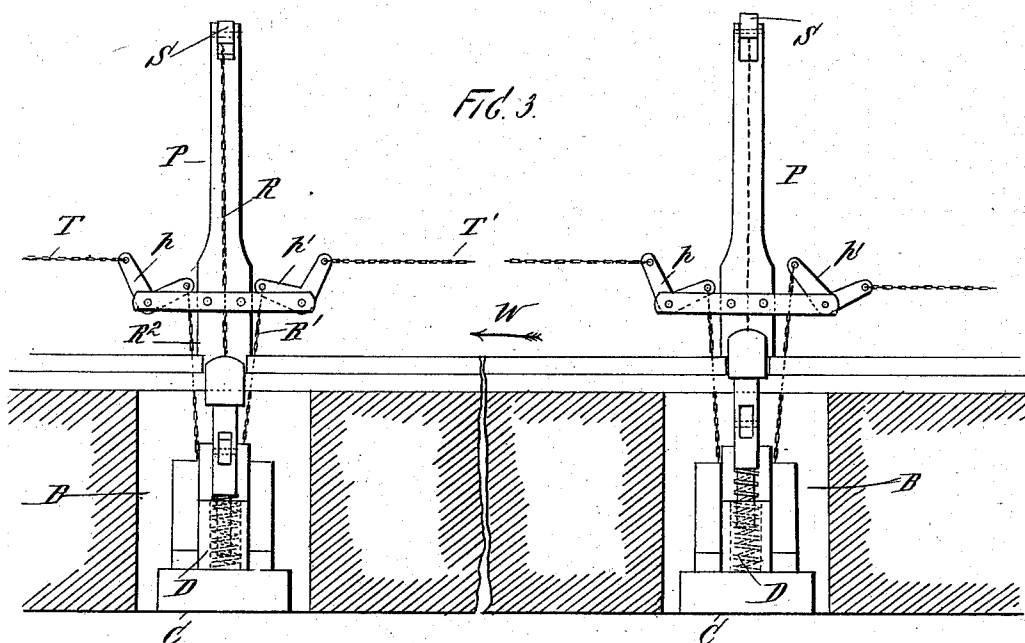
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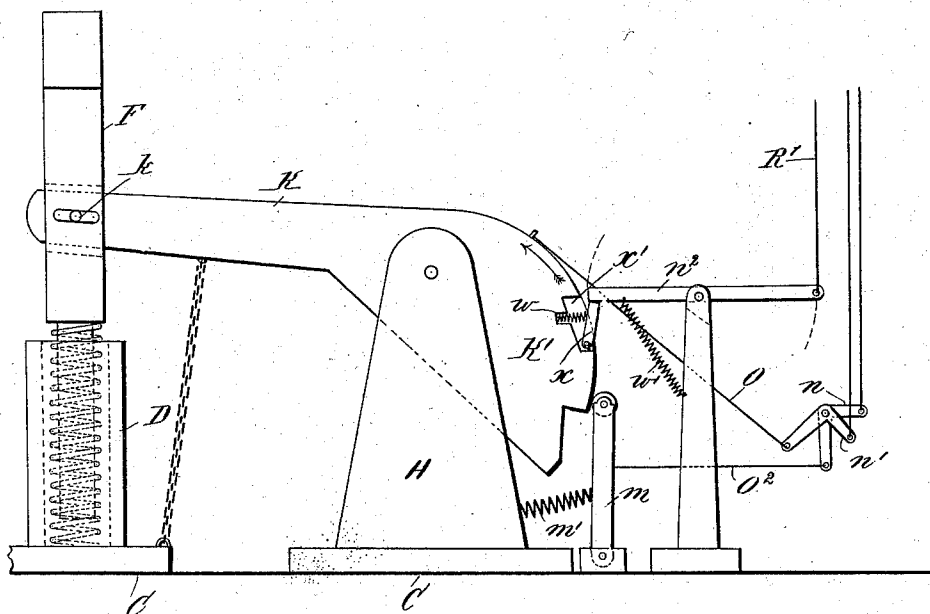
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Fcd. 5.



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UNITED STATES PATENT OFFICE.

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AUTOMATIC BLOCK-SIGNAL SYSTEM FOR RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 558,097, dated April 14, 1896.

Application filed July 23, 1895. Serial No. 556,959. (No model.)

To all whom it may concern:

Be it known that I, FRANK R. PAGE, a citizen of the United States, and a resident of Montvale, in the county of Bergen and State of New Jersey, have invented certain new and useful Improvements in Automatic Block-Signal Systems for Railways, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof, in which similar letters of reference indicate corresponding parts.

This invention relates to block-signal systems for railways; and the object thereof is to provide a signal system of this class which is simple in construction and operation and which is also automatic, being operated entirely by passing trains, and which is positive and direct in operation, the various elements of the system being in mechanical connection; and with these and other objects in view the invention consists of the construction, combination, and arrangement of parts hereinafter described and claimed.

The invention is fully disclosed in the following specification, of which the accompanying drawings form a part, and in which—

Figure 1 is a plan view of a portion of the construction embodying my invention; Fig. 2, a sectional side elevation on the line 2 2 of Fig. 1, showing the cover and bottom of the chamber in which the operating mechanism is located in section; Fig. 3, a similar elevation on the line 3 3 of Fig. 1; Fig. 4, a side elevation on the line 4 4 or opposite to that shown in Fig. 3, and Fig. 5 a modification.

In the practice of my invention I form beneath one of the rails A of the track, at suitable intervals, the distance to be determined by the length of the blocks between the signals, a chamber B, in the bottom of which is placed a plate or support C, and this chamber B extends from beneath one of the rails of the track a short distance therefrom at right angles thereto.

On the inner end of the plate C is secured a vertical tubular support D, in which is placed a spiral spring E, which is designed to support a vertically-movable plunger F, the upper end of which extends through one of the rails of the track, as shown in Fig. 1, the rail in Fig. 1 being indicated at G, or instead of passing through the rail the plunger F may be situated thereby, the object being to have said plunger so arranged as to be operated

by the wheels of a car. Connected also with the base-plate C, at the side of the tubular support D, are vertical standards H, having base extensions h, and pivoted between the tops of the standards H is a lever K, having a drumhead K', which extends forward and is pivotally connected with the plunger F by means of a pin which passes through and through transverse slots in the plunger, as shown at k, and it will also be observed that the end of the lever itself, as shown in Fig. 2, passes through said plunger or a vertical slot formed therein. The drumhead K' of the lever K is provided on the side opposite the plunger F with a notch or recess k', the lower side of which is downwardly inclined, said recess being adapted to receive a roller M, which is connected with the upper end of a bar m, the lower end of which is pivotally connected with the plate C between the standards H, or the lower end of which may be pivotally connected with the extension h of said standards.

Connected with the arm of the lever K is a chain h², the lower end of which is secured to the plate C, and connected with the pivoted bar m is a strong spiral spring m', which is also secured to the plate H in front of said bar.

Arranged in the chamber B in line with the lever K and its supports are vertical standards N, between which are mounted three crank-levers n, n', and n², all of which are shown in Fig. 1 and two of which are shown in Fig. 2, and connected with the inner ends of the levers n' and n² are cords or chains O and O', the other ends of which are secured to the drum of the lever K, and connected with the crank-lever n is a cord or chain O², the other end of which is secured to the pivoted bar m.

Secured above the ground in any desired manner and directly over the standards N is a vertical post P, to which are secured side bars P' and P², and between these side bars at opposite sides of the post P are mounted crank-levers p and p', and connected with the levers n' and n², mounted between the standards N, are chains or cords R and R', respectively, which extend upwardly, the first of which, R, is connected with the end of the signal-arm S, which is pivotally connected with the upper end of the post P, and the second of which, R', is connected with the inner

end of the pivoted crank-lever p' , as clearly shown in Figs. 2 and 3.

Connected with the outer end of the crank-lever n is a chain or cord R^2 , the upper end of which is connected with the inner end of the crank-lever p , as is also shown in Figs. 3 and 4, and connected with each of the crank-levers p and p' are chains or cords T and T' , respectively, each extending in opposite directions, as shown in Figs. 3 and 4, and which connect with similar mechanism arranged at predetermined intervals, the distance being determined by the length of the blocks between the signals, as will be readily understood.

It will be observed that the construction at each end of a block or at each station is precisely the same as that hereinbefore described, and it may also be necessary to state at this time that my improved signal system is designed principally for operation in connection with double-track railways and is therefore chiefly serviceable on tracks on which the trains all move in the same direction, and in connection with double-track railways a line of signals will be employed in connection with each track, as will be readily understood.

The operation will be apparent from the foregoing description when taken in connection with the accompanying drawings, and is substantially as follows: If a train be moving in the direction of the arrow W , (shown in Figs. 1 and 2,) the first plunger F which is struck thereby will operate to throw down the corresponding lever K to raise the corresponding signal-arm S by means of the chain O and the lever n' , and as the train proceeds the signal-arm S first raised will remain in the raised position, or at "danger," until the train reaches the next signal-station, the plunger of which will be depressed in the same manner, and the corresponding signal-arm of which will be raised in the same manner, and at the same time the signal-arm last passed will be lowered by means of a chain O' , the crank-lever n^2 , the crank-lever p' , and the chain T' , by means of which the pivoted arm m is drawn outward, releasing the lever K , when the arm S will be lowered by its own weight. It will thus be seen that as the train proceeds the signal-bar at the last signal-station is raised to "danger" and the one last passed is lowered, showing that the block between the same is clear, and this operation will be repeated to the end of the line.

In the modification shown in Fig. 5 I mount the lever n^2 between vertical standards, and this lever consists of a straight bar instead of a crank-lever, as shown in the other figures of the drawings, and secured to the inner end thereof is a spiral spring w' , one end of which is connected with one of the standards by which the lever is supported, and said end of said lever is adapted to rest upon a short lever X , pivotally supported in a recess X' , formed in the drumhead of the lever K and which is operated by a spring w . The cord

R' , which connects with the pivoted bar m , is attached to the other end of the lever n^2 , and the operation of this form of construction will be substantially the same as that hereinbefore described.

It is evident that changes in the form, construction, combination, and arrangement of the various parts of my improved signal system may be made without departing from the spirit of my invention or sacrificing its advantages, and I therefore reserve the right to make such alterations as fairly come within the scope of the invention.

Having fully described my invention, I claim and desire to secure by Letters Patent—

1. An automatic signal system, for railways, consisting of a series of similar signals arranged at predetermined intervals along the track, each of which comprises a vertically-movable spring-supported plunger adapted to be operated by the wheel of a train, a lever pivotally supported adjacent to said plunger and pivotally connected therewith, a pivoted vertical bar provided with a roller at its upper end adapted to operate in connection with a recess formed in the end of said lever, a post, the upper end of which is provided with a pivoted signal-arm, which is in operative connection with said lever and adapted to be raised and lowered thereby, said post being also provided with crank-levers at each side thereof one of which is connected with said pivoted bar at the station, and the other of which is connected with the pivoted bar and a corresponding crank-lever at the adjacent station on that side which is connected with a corresponding pivoted lever at that station, substantially as shown and described.

2. In an automatic signal system, the combination of a vertically-movable plunger adapted to be operated by a wheel of a train, a signal, a bell-crank lever arranged below the signal and connected therewith, a lever K adapted to be operated by the plunger and having a recess k' therein, a pivoted bar m provided with a roller M arranged to fit in said recess and a connection between the bell-crank lever and the said lever K , substantially as described.

3. In an automatic signal system, the combination of a vertically-movable plunger adapted to be operated by the wheel of a train, a lever K operated by said plunger, the bell-crank levers n' , n^2 , connected with said lever K by chains O , O' , a signal, a bell-crank lever connected with said signal and said lever K adapted to be operated by the lever to raise or lower the signal, substantially as described.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 22d day of July, 1895.

FRANK R. PAGE.

Witnesses:

L. M. MULLER,
S. L. HAWKSHURST.