(No Model.) 2 Sheets—Sheet 1.

W. C. FLETCHER.

RAILROAD CROSSING.

No. 492,770. Patented Feb. 28, 1893.

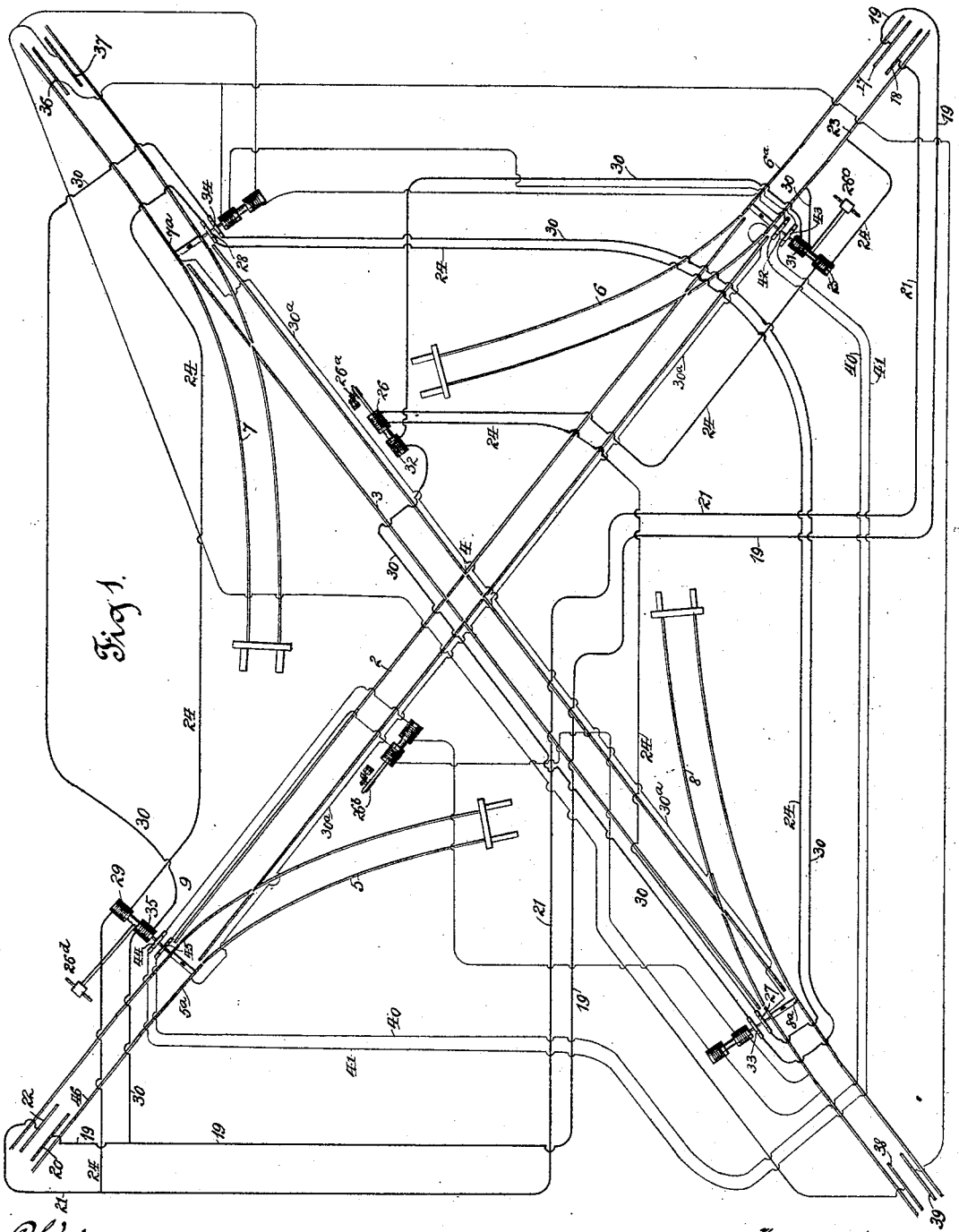


Fig. 1.

Witnesses
Wm. F. Fleming.
Wm. M. Rheem.

Inventor
Wendell C. Fletcher
by Raymond & Vreeden
Attorneys.

(No Model.) 2 Sheets—Sheet 2.

W. C. FLETCHER.

RAILROAD CROSSING.

No. 492,770. Patented Feb. 28, 1893.

Fig 2.

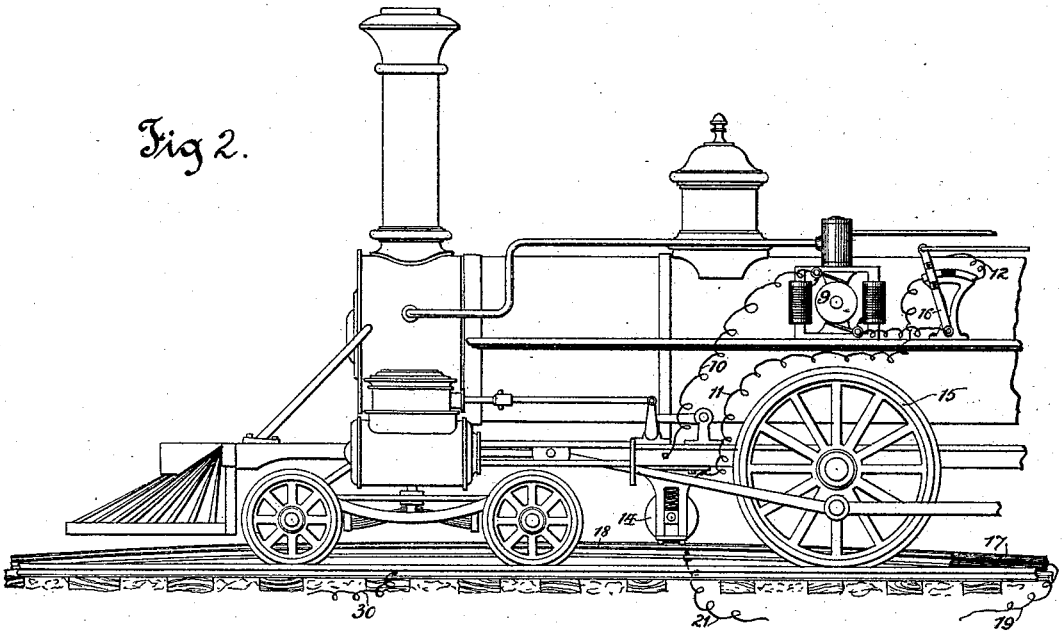
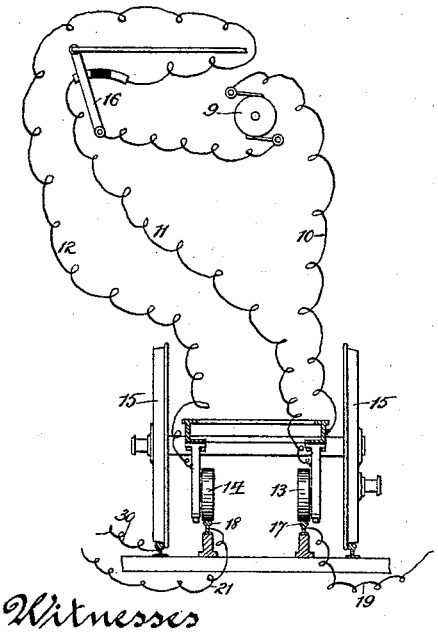


Fig 3.



Witnesses
Wm. T. Fleming.
Wm. N. Rheem.

Inventor
Wendell C. Fletcher
by Raymond & Vieder Attorneys.

UNITED STATES PATENT OFFICE.

WENDELL C. FLETCHER, OF ST. LOUIS, MISSOURI, ASSIGNOR TO NORMAN P. WILLARD, TRUSTEE, OF CHICAGO, ILLINOIS.

RAILROAD-CROSSING.

SPECIFICATION forming part of Letters Patent No. 492,770, dated February 28, 1893.

Application filed May 27, 1892. Serial No. 434,659. (No model.)

To all whom it may concern:

Be it known that I, WENDELL C. FLETCHER, a citizen of the United States, residing at St. Louis, in the State of Missouri, have invented certain new and useful Improvements in Railroad-Crossings, of which the following is a specification, reference being had to the accompanying drawings.

My invention is intended to provide means whereby the crossing of two railroads at grade is automatically protected so that two trains cannot enter the crossing at the same time, the passage of a train over one main line acting as an absolute block to the approach of a second train to the crossing from the other main line. After a train has passed, the apparatus is automatically reset so that the crossing is open to approach from either line.

In the accompanying drawings: Figure 1 is a plan giving a diagrammatic view of the crossing and the apparatus for governing the same. Figs. 2 and 3 are views of a locomotive showing the connections thereon by which the crossing apparatus is controlled.

2 (Fig. 1) designates one main line, 3 designating the other line. 4 designates the point at which they cross. Side tracks 5, 6, 7 and 8 branching from the main lines 2 and 3 respectively, are so placed as to face the train upon its approach to the crossing and the switch rails 5^a, 6^a, 7^a and 8^a are normally in such a position as to connect the main track with the sidings 5, 6, 7 and 8 respectively. It is necessary, therefore, in order to allow a train to pass over the crossing and reach the main line beyond, that a pair of switch rails 5^a and 6^a or 7^a and 8^a be shifted so as to connect with the main line. Such shifting is automatically effected as the train approaches the crossing, by the apparatus hereinafter described, provided a train has not already entered the crossing, on the other track. If a train has entered the crossing, the second train will not be able to shift the switch rails on its line of track and it will be directed to the siding, which siding of course must be made long enough to allow the train to be brought to a state of rest after the engineer perceives that he is not able to take the crossing.

The apparatus for operating the switches consists of a series of electrical circuits operated by a small dynamo on the engine or some other source of electricity, which may be either fixed by the track or carried by the engine. As shown herein, the source of electricity is a small dynamo 9 upon the engine from which three wires, 10, 11 and 12 are led to suitable contact wheels 13 and 14 respectively and one or both of the drivers 15. By means of a suitable switch 16 circuits may be formed through either of two contact pieces 17 and 18 secured between the tracks in apposition to the contacts 13 and 14. Thus, either of two circuits may be made by shifting the switch 16 which is under the control of the engineer. Tracing the circuits which extend from the contacts 17 and 18 and through the track rails adjacent beginning at the lower right hand corner of the digram Fig. 1, it will be observed that from the contact 17 the wire 19 extends to the contact 20; that from the contact 18 the wire 21 extends to the contact 22; that from the track rail 23 the wire 24 passes to the magnet coil 25 thence to the magnet coil 26, thence to the switch 27 which is connected to the switch rails 8^a, thence through the coil 29; and it finally makes a junction with the wire 21 whence the circuit may be completed either through the contact 22 at one side of the crossing, or the contact 18 at the other side of the crossing. From the track rail 23 also starts a circuit wire 30, which passing through a magnet coil 31 extends thence to the magnet coil 32, the switch 33 connected to the switch rail 8^a, the switch 34 connecting to the rail 7^a, thence to the magnet coil 35 and finally to the wire 19 whose course has been already described. The wire 30^a extends from the magnet coil 31 to the track rail 46. Instead of this wire the track rail may be used, but I prefer an independent wire as shown. The circuits from the contacts 17 and 18 and the opposite contacts 20 and 22 and their corresponding main rails, have now been described, said circuits being distinguished from those connected to the main line 3 by being drawn in heavy lines. Similar circuits are shown in fine lines as extending from the contacts 36, 37, 38 and 39 and their

corresponding track rails. These circuits are duplicates of those just described as extending from contact 17, 18, 20 and 22 and their track rails and therefore need not be described in detail. The magnet coils 25, 31, 26, 32 &c. are intended to act as electric motors and are merely illustrative as any electro motor adequate to the performance of the duty required may be substituted therefor. Magnet coils 25 and 31 are connected to the switch rails 6^a and are intended to move them in one direction or the other accordingly as a current is passed through one coil or the other. The coils 29 and 35 are in like manner connected to the switch rails 5^a and have a similar operation. The magnet coils 26 and 32 are intended to operate a signal which is moved to indicate danger whenever a train is crossing the main line which the signal guards.

The operation of the apparatus is as follows: Supposing a train is approaching the crossing on the main line 2 from the lower right hand corner as shown by the diagram Fig. 1. If the engineer desires to reach the crossing and not to run on the side track, he shifts the switch upon his engine so as to pass a current through the contact wheel 14 of his engine which is in apposition with the fixed contact 18 between the tracks. He thus bridges the gap between the contact 18 and the track rail 23, a circuit including the dynamo 9 being thus completed through the track rail 23, wire 24, magnets 25, 26, switch 27 and 28, magnet 29 and back through wire 21 to the contact 18. The current passing through this circuit will operate the motor magnets 25 and 29 and the rails 6^a and 5^a and will thus be shifted to make connection with the main track. At the same time the signals 26^a will be set at "danger." The act of shifting said rails will break the circuits 40 and 41 which control the switches of the main line 3 by reason of the fact that the operation of said circuits is through the switches 42 and 43 which are connected to the switch rails 6^a. In like manner the movement of the track rails 5^a will also shift the switches 44, 45 and break the circuits connected to the main line 3. Thus the act of closing the main line 2 so that the train will pass the crossing, opens the circuit controlling the main line 3 and renders it impossible to shift the switch rails of said main line to the main track. Any train approaching on the main track 3 will thus be side-tracked until the crossing has been cleared by the train on the main line 2. Said clearance is effected automatically when the train reaches the farther contacts 20 and 22. The same setting of the electric switch on the engine which completed the circuit through the track rail 23 and the contact 18, will, when the contact 20 is reached, complete the circuit between said contact and its adjacent track rail. This will make the circuit through the wire 19 to its point of junction with 30, thence through the wire 30 to the coil 35, the passage of a current through said coil shifting the rails 5^a over to the siding, thence through the switches 34 and 33 to the coil 32, thence to the coil 31 which will reset the switch 6^a to the siding, thence back through the wire 30^a to the rail 46, thus completing the circuit.

It is obvious that the signals 26^a and 26^b, are operated on the same principle and in substantially the same manner as the switches 5^a, 6^a, &c. Similar signals such as 26^c, 26^d, working in harmony with the switches, might be placed in each circuit on the main line which such circuit covers, as well as on the crossing line. But in such a case, the normal position of the signal would be at "danger" and if the circuits controlled by the approaching train were broken by the prior shifting of the signals on the other track, the signals could not be shifted and the engineer would thereby be warned to stop. Such signals might be used as an additional safeguard warning the engineer before he reached the switch; or, such a signal would constitute a safe-guard in itself even in the absence of the safety switches.

It is obvious that the integrity of the circuits may be made to depend upon the proper position of several signals or switches as well as of one; so that the apparatus is adapted to guard several crossing lines. It is furthermore obvious that a crossing not only of two lines of railway tracks but of a railway with any road or way may be protected by this apparatus, such modifications in detail as are necessary to adapt it to different situations being easily made by one skilled in the art, to the apparatus.

I claim—

1. The combination in a railway crossing protective apparatus of side tracks at the approaches to the crossings; switch rails adapted to connect with the side track or the main line; electric motors operating said switch rails; electric circuits controlling said motors; circuit breakers connected to and operated by said switch rails, the circuit breakers interrupting the action of the circuits controlling one crossing line being connected to the switch rails of the other crossing line; and means for completing the circuits controlling the switches of each line when a train approaches, substantially as described.

2. The combination with a railway crossing of side tracks at the approaches to said crossing; switches normally set to lead from the main lines to the side tracks; electric motors connected to and operating said switches; electric circuits controlling each pair of switches belonging to each main line; contacts upon the train for completing the electric circuits controlling the switches of its line; and stationary contacts upon the sides of approach and recession so arranged that the same setting of the moving contacts that

throws the switches in one direction on the approach of a train to the first contacts throws the switches in the opposite direction as the train reaches the second stationary contacts, substantially as described.

3. The combination with two or more lines of railway which cross each other of a separate set of electric circuits for each main line; means for breaking each set of circuits operated by the passage of a train on the crossing lines; means for completing said circuits carried by the locomotive or train; and safe guards at the approaches of the crossing normally obstructing entrance to said crossing but operated by the closure of said circuits to clear the approach to said crossing, substantially as described.

4. The combination with a railway crossing of safeguards for said crossing normally obstructing the approach to said crossing; electric circuits controlling said safeguards; means adapted to close said circuits and clear the approach to said crossing; and means adapted to break said circuits by the setting of safeguards to permit passage across said railway line, substantially as described.

WENDELL C. FLETCHER.

Witnesses:

L. THOMPSON,

JAMES P. LYNCH.