

F. J. McQUEEN.

ELECTRIC TRAIN CONTROLLING SYSTEM.

No. 347,628.

Patented Aug. 17, 1886.

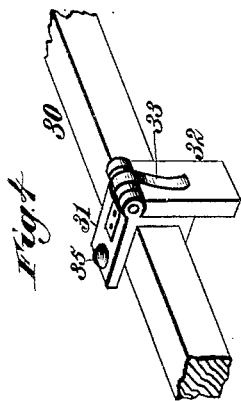
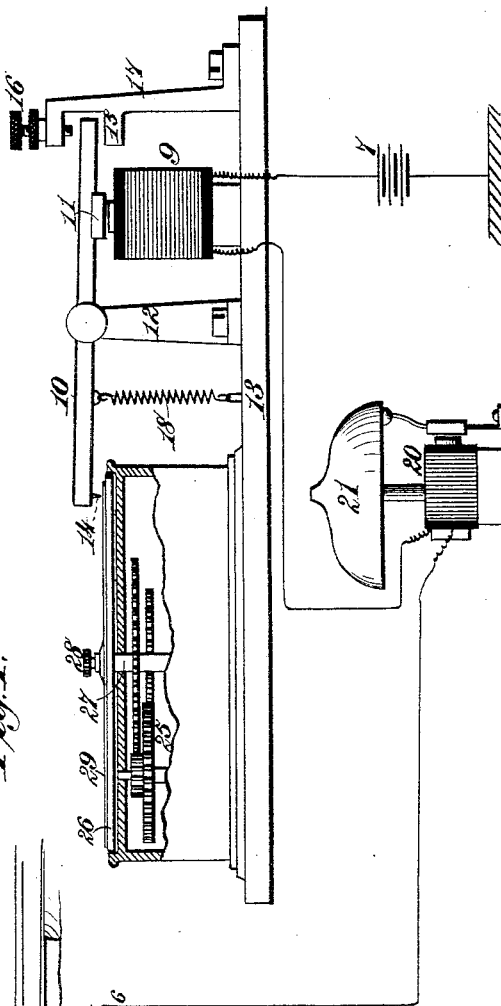
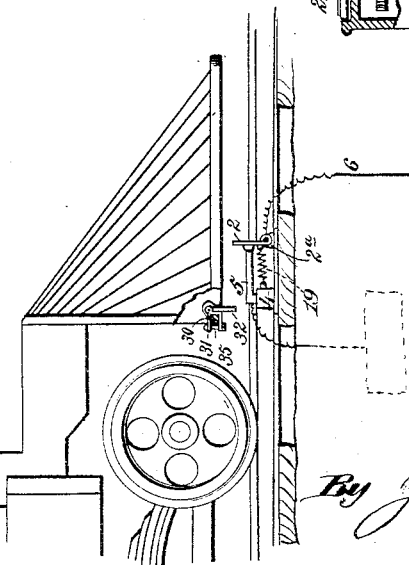


Fig. 1.



Witnesses,
Robert Emmett,
Geo. W. Rea



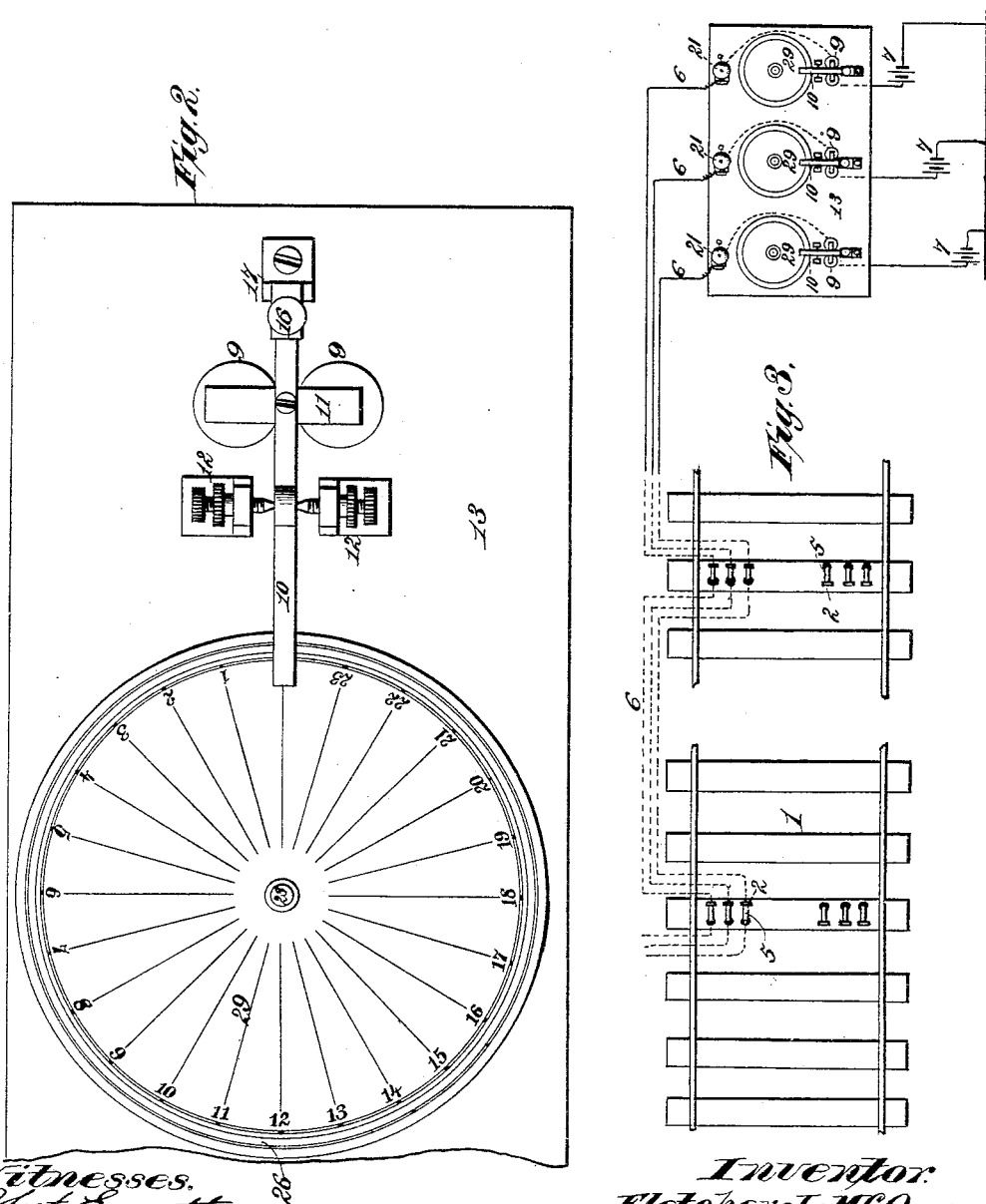
Inventor:
Fletcher J. McQueen.
By James L. Norris
Atty.

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UNITED STATES PATENT OFFICE.

FLETCHER J. McQUEEN, OF OCALA, FLORIDA.

ELECTRIC TRAIN-CONTROLLING SYSTEM.

SPECIFICATION forming part of Letters Patent No. 347,628, dated August 17, 1886.

Application filed April 30, 1886. Serial No. 200,624. (No model.)

To all whom it may concern:

Be it known that I, FLETCHER J. McQUEEN, a citizen of the United States, residing at Ocala, in the county of Marion and State of Florida, have invented new and useful Improvements in Electric Train-Controlling Systems, of which the following is a specification.

The object of the present invention is to provide means for controlling the movement of railroad-trains and obtain a permanent record in a main or supervising office of the position and speed of trains at any distance from such supervising office.

The invention consists in a recording-instrument comprising a clock-work and revolving graduated dial, a stylus or marking device held out of action by an electro-magnet included in an electric circuit and brought into action by the breaking of such circuit through the medium of a moving railroad-train at any distant point or station. When a train reaches a point or station within the division belonging to a certain supervising office, it serves to actuate a circuit-breaking device arranged between the track, and in consequence thereof a record of the position of the train and its speed is made at the distant supervising office, and an alarm is simultaneously sounded. A series of such circuit-breakers, electric circuits, and recording-instruments are provided so as to control the movement of different trains on the same track.

The invention briefly outlined in the above statement will be hereinafter more fully described, and then set forth in the claims.

In the accompanying drawings, Figure 1 represents my arrangement of electric circuit, contact-breaker, recording-instrument, annunciator, and battery. Fig. 2 is a plan view of the recording-instrument. Fig. 3 is a plan view of a railroad-track and series of circuit-breakers, circuits, and recording-instruments. Fig. 4 is a detail view of a yielding and laterally-adjustable striker on a locomotive or car.

In order that the invention may be properly understood, I will first give a brief general description of the system, the relation of the various instruments, and their electric connections.

All the stations included in a railroad division are under the supervision of an official

at a main station, and means are provided for graphically recording the position of trains departing from or approaching said main or supervising station. I attain such result by providing as many electric circuits as there are trains to be controlled, and in each of said circuits is included an instrument adapted to mark down or represent graphically the position of a train relatively to the stations in the railroad division. The electric circuits are normally closed, and they contain circuit-breakers or contact-making devices which are operated by devices carried by the locomotive, or by the cars and locomotive, in order to operate the recording device at the supervising station. The recording-instrument is an ordinary clock, the main arbor of which carries a disk adapted to hold a tablet upon which is printed a dial-face corresponding to a period of time—say, twenty-four hours—the names of stations, the number of the train, and such other information as may be necessary for the perfect control of the running of trains. The dial receives a uniform progressive movement by the clock, and hence whenever the circuit is broken by a moving train an imprint mark or puncture is made on the dial by the stylus or marker, and the marks thus made serve to indicate the position of the train relatively to the stations of the division and the speed at which the trains are traveling.

Referring to Fig. 3, the reference-numeral 1 designates a railway-track between which are arranged a series of electric-circuit breakers or keys adapted to be operated by moving trains. These circuit-breakers are arranged in groups at different distances away from the track-rails, and the trains running on the track are adapted to actuate each a different circuit-breaker by striking devices arranged on the locomotive or the latter and the cars in proper alignment with the circuit-breakers on the track. Since all the circuit-breakers are alike in construction, the description of one will answer for all.

The numeral 2 designates a vertical metal arm, which is pivoted to a foot-piece or bracket, 2^a, on a cross-tie or other support on the road-bed. In proximity to this pivoted arm is arranged an insulating-block, 4, which receives an angle-piece, 5, of metal, having its vertical portion seated in said insulating-

block and its horizontal portion extended to normally make contact with the arm 2. A spiral spring, 19, connected with the insulating-block and arm 2, serves to hold the latter in contact with the angle-piece 5. A complete electric circuit is formed one half by a line-wire, 6, which is preferably arranged along the track-rails either above or below ground, and the other half by the ground itself. The wire 6 is connected with the metal piece 5 and pivoted arm 2, and it extends to the supervising office, where it is connected with the poles of a battery, 7. The electric circuit thus formed includes an electro-magnet, 9, at the supervising office, and in co-operative relation to this electro-magnet is arranged a centrally-pivoted lever, 10, bearing an armature, 11, which is normally attracted by the electro-magnet. The lever 10 is pivoted to a post, 12, rising from a base-board, 13, and at one end it bears a stylus or marking-point, 14, which is disposed immediately over a recording-instrument, as will be hereinafter explained, for the purpose of making a puncture or mark on a dial. The other end of the lever 10 moves between a lug, 15, and stop-screw 16 on a vertical arm or bracket, 17, these devices serving to define or limit the movement of the lever. A coiled spring, 18, is connected with the lever 10 and base-board 13, and serves to pull its stylus-bearing end down upon the recording-instrument when the electro-magnet is demagnetized by the breaking of the electric circuit through the medium of a train coming in contact with any of the series of circuit-breakers located in such circuit along the track. The electric circuit, in addition to the aforementioned electro-magnet 9, contains the electro-magnet 20 of an annunciator or alarm-bell, 21, the hammer of which is released when the circuit is broken. A spring or other device will cause the bell to ring, attracting the attention of the supervising officer to the record being made.

The recording-instrument consists of a clock or time movement, 25, which is adapted to propel a graduated dial at a regular speed past the marking point or stylus 14. To the main arbor of the time-movement is applied a disk, 26, having a central pin, 27, and clamping-nut 28, for retaining in position a dial, 29, in the form of a tablet or sheet of paper or other suitable material. This dial 29 is preferably divided into twenty-four segmental spaces, corresponding to the hours of the day, and it also bears an inscription indicating the number of the train and the names of the stations along the line.

It will be understood that the circuit-breakers are placed in the line-circuit at known or predetermined distances apart, and hence it is apparent that the position of each train is graphically indicated whenever a circuit-breaker is operated thereby, and I thus obtain a reliable control over the speed of trains, and can observe at the supervising office the exact time when each train passes certain given points along the line, in addition to ob-

taining a perfect registration of the arrival and departure of trains from stations along the line.

The means carried either by the locomotive alone or by the locomotive and cars for actuating the circuit-breakers or track-keys may be described as follows, viz: A transverse bar, 30, (shown in Fig. 4 as being fixed to a locomotive,) receives a collar or clasp, 31, to which is pivoted by a pintle and ears a pendent plate, 32, which projects sufficiently far down to come in contact with the track-key or circuit-breaker. A spring, 33, bears upon the plate 32, and is secured to the collar 31, for holding said plate in proper position. A locomotive advancing toward a circuit-breaker arranged in line with its striking arm or plate 32, will insure the breaking of the circuit by coming in contact with the arm 2 and moving it away from the angle-piece, and hence causing a permanent record to be made at the supervising office in the manner already described. The clasp 31 is firmly held on the bar 30 by a clamping-bolt or set-screw, 35, and by loosening the latter it can be shifted along the bar to bring it in line with any one of the circuit-breakers or track-keys belonging to different recording-instruments. The object of this lateral adjustment is to provide for the changing of the number given to trains, as will be obvious. I may, whenever desired, provide each car of a train with a striking device, such as I have above described, and in such event the number of cars on a train will be duly recorded at the supervising office. When cars have such striking devices, it is necessary that they should be adjustable in the manner described in connection with the locomotive, because provision must be made for using such cars on trains bearing different numbers, and consequently co-operating with different keys along the track.

In Fig. 3 I have shown groups of circuit-breakers arranged at opposite sides of the track and adapted to be operated by trains traveling in opposite directions. It should be stated that the circuit-breakers arranged along a railroad-track in the above-described manner will permit the supervising office to be signaled when a train meets with an accident or its movement is otherwise arrested. In such event the circuit-breaking arm can be operated by a suitable lever, so that it will serve as a telegraph-key for giving appropriate signals upon the bell at the supervising-station.

I claim—

1. In an electro-railroad-train-controlling system the combination, with the closed line-circuit adapted to be opened by a moving train, of the station apparatus, consisting of the continuously-moving clock, the graduated circular dial or tablet moved by said clock, the centrally-pivoted lever, the marking point or stylus carried by one end of said lever and arranged above the circular graduated dial, the armature at the opposite end of

the lever, the electro-magnet arranged in co-
operative relation to said armature and in-
cluded in the line-circuit, and the spring con-
nected with the lever for causing the stylus
5 carried by the same to make a record on the
graduated dial when the circuit is broken by
a passing train, substantially as herein set
forth.

2. In a railroad-train-controlling system,
10 the combination, with a locomotive or car, of
a laterally-adjustable striking device, consist-

ing of a sliding collar and a pivoted spring-
pressed arm or plate, with a series of parallel
track-keys or circuit-breakers, electric cir-
cuits, and recording devices, substantially as 15
herein set forth.

In testimony whereof I have affixed my sig-
nature in presence of two witnesses.

F. J. McQUEEN.

Witnesses:

JAMES L. NORRIS,

J. A. RUTHERFORD.