

E. W. COLE.
TRAIN REGISTER.

APPLICATION FILED NOV. 10, 1910. RENEWED MAY 1, 1912.

1,044,141.

Patented Nov. 12, 1912.

3 SHEETS—SHEET 1.

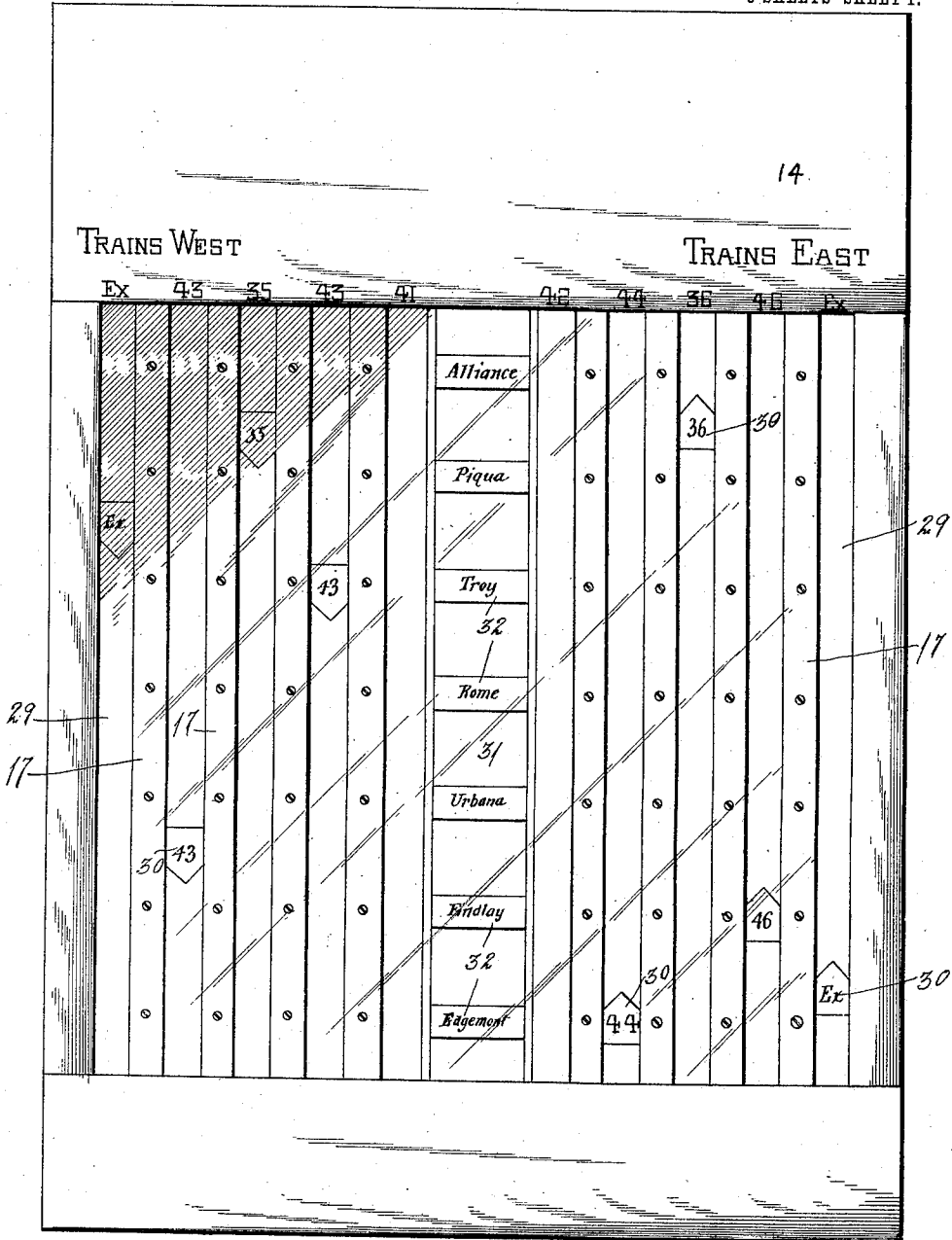


Fig. 1.

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53 SHEETS-SHEET 2.

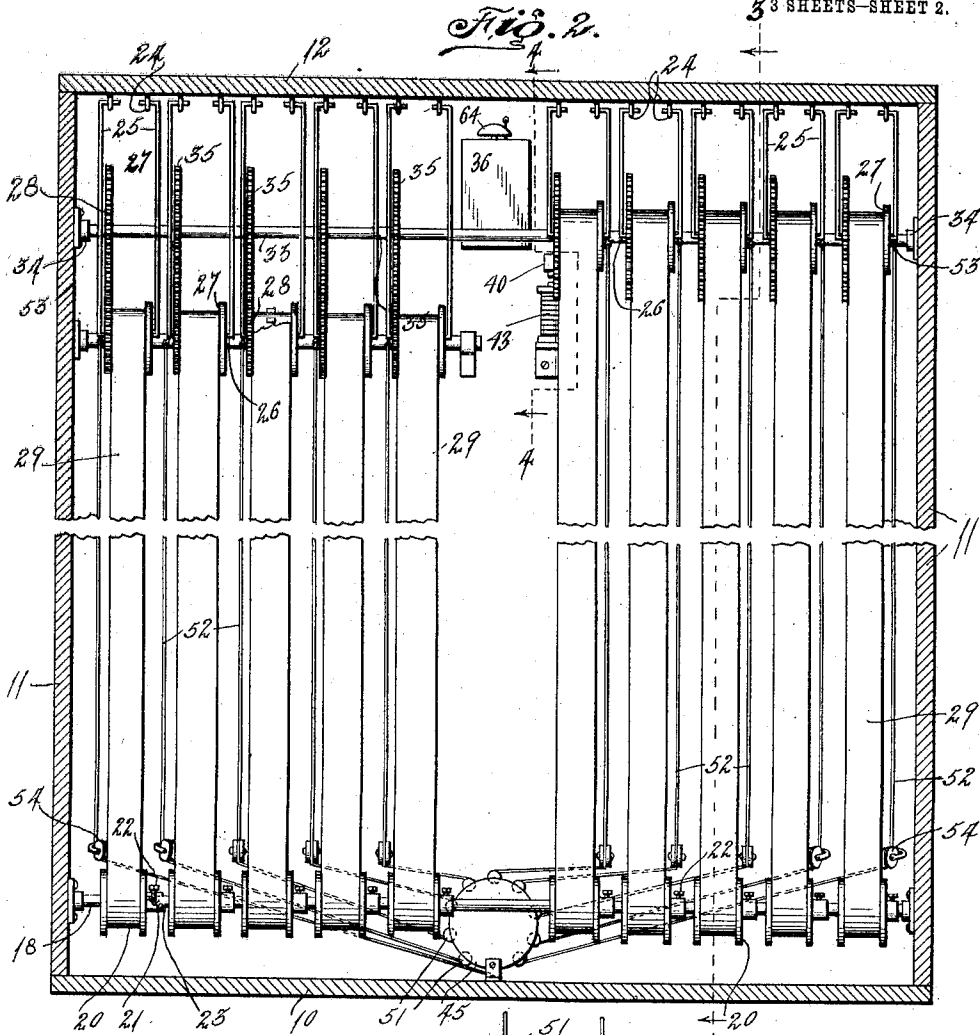
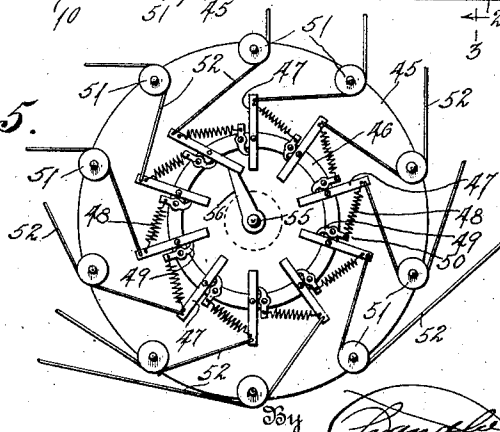


Fig. 5.



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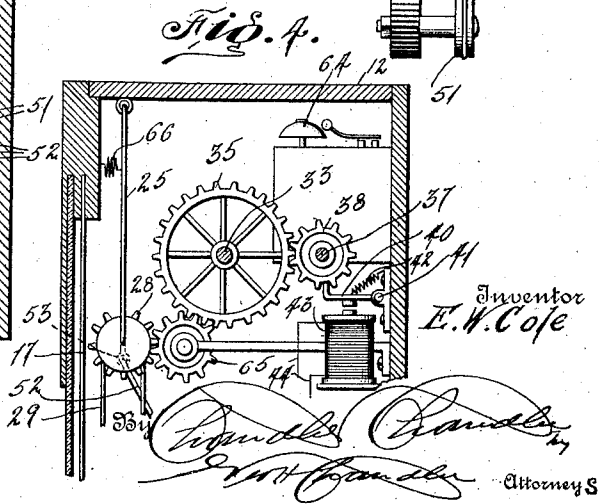
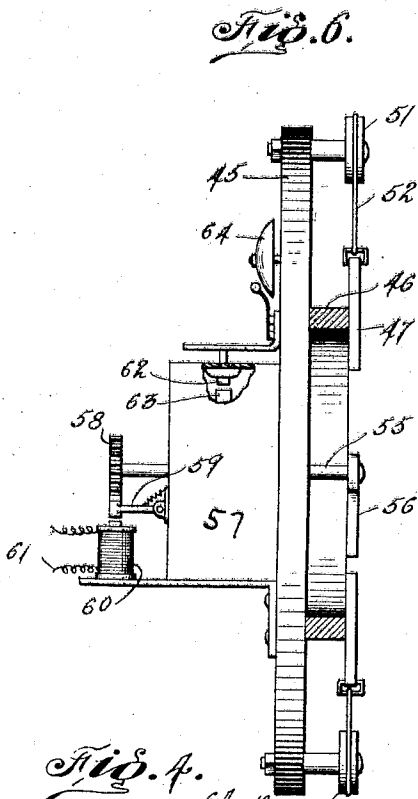
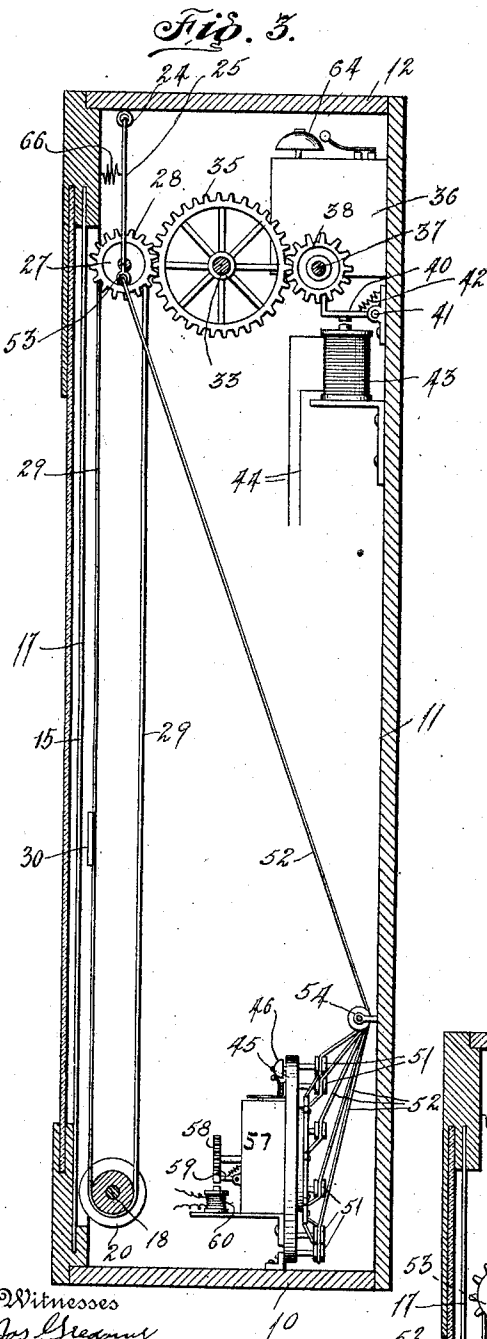
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UNITED STATES PATENT OFFICE.

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TRAIN-REGISTER.

1,044,141.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, EUGENE W. COLE, a citizen of the United States, residing at Edgemont, in the county of Fall River, State of South Dakota, have invented certain new and useful Improvements in Train-Registers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to devices for indicating in railway stations the movements of trains advancing in the direction of or receding from the station.

The object of the present invention is to provide a register designed to be operated by the chief despatcher closing an electric circuit which simultaneously actuates a train of clockwork mechanism in each separate station on the route, this mechanism serving to actuate an endless ribbon which carries a marker designating the number of a train in motion; the operator intermittently closing said electric circuit so as to move said marker into registration with the station name on a chart or dial after telegraphic information has been received that the train has arrived at that particular station.

In the accompanying drawings forming part of this specification:—Figure 1 is a front elevation of the device. Fig. 2 is a longitudinal sectional view of the device. Fig. 3 is a cross sectional view of the device taken on the line 3—3, Fig. 2, with parts removed. Fig. 4 is a cross sectional view of the device taken on the line 4—4, Fig. 2, with parts removed. Fig. 5 is a front elevation of the actuating levers and their mountings. Fig. 6 is a side elevation of the actuating levers and their mountings.

Referring now to the drawing, a casing is shown comprising a bottom 10, end walls 11, top wall 12, and front wall 14, the latter being mutilated by a series of vertical slots 15 in which endless ribbons hereinafter described work, the strips of material between these slots being provided on their outer

faces with metal strips 17, the edges of which overhang the slots and form guides to prevent disengagement of the ribbons.

A stationary shaft 18 is journaled in suitable bearings secured to the inner faces of the end walls adjacent the casing bottom, and upon this shaft is loosely mounted a plurality of spools 20, these spools being provided with hubs 21, through which set screws 22 are threaded, and these set screws project into circular slots 23 formed upon the stationary shaft so that the spools are free to turn upon the shaft without advancing therealong.

Depending from the top wall of the casing and overlying each spool is a pair of aligned eye bolts 24, these eye bolts loosely receiving the hooked extremities of a U shaped hanger 25, this hanger carrying upon its bridge portion 26 a spool 27, this spool being equipped on one of its flanges with teeth 28, by means of which the spool is actuated as will presently be described.

An endless ribbon 29 is trained over the above described spools, this ribbon as above stated, working in one of the slots in the front wall of the casing and underlying the edges of the metal guide strips 17. Fixed upon this ribbon is a marker 30, this marker having printed on its outer face the number or name of a train as shown. It will here be stated that each of the ribbons is movable independent of its neighbors so that each marker as its supporting ribbon is actuated will be moved vertically from the bottom toward the top of the casing.

The medial slot 31 of the series of slots in the casing front wall does not support one of the endless ribbons above described, but instead is equipped with a plurality of designation plates 32, each plate having its end edges secured to the sides of the slot in any preferred manner and underlying the guide plates upon the edges of the slot. The names of the stations along the route are printed on these designation plates, and herein shown the station Edgemont at one end of the route is printed upon the lowest designation plate, and the station Alliance

at the opposite end of the route is printed upon the uppermost designation plate. When the train is at Edgemont, the marker for that train is brought into alinement with the name Edgemont and as the train advances in the direction of Alliance, its marker will be mechanically moved vertically into alinement with the designation plate so that the station agent at Alliance, for instance, may know from a glance at the board at just what station any particular train is at any particular time.

The means for actuating the ribbons will now be described:—A driving shaft 33 is journaled in bearings 34 mounted upon the inner faces of the ends adjacent the top of the casing. Keyed to this shaft at intervals are gears 35, these gears being adapted to mesh with the teeth 28 formed upon the spool flanges when the spools are rocked rearwardly in the casing by mechanism hereinafter described. The driving shaft is rotated by means of an ordinary clockwork mechanism 36, the driving shaft 37 of this clockwork mechanism being equipped with a gear 38 which meshes with a gear 35 fixed to the shaft 33.

For starting and stopping the clockwork mechanism, an angular pawl 40 is pivotally mounted upon the inner wall of the casing as shown at 41 and is normally held in engagement with the gear 38 by means of a spring 42. An electro-magnet 43 is fixed to the inner wall of the casing adjacent to the pawl and when this magnet is excited by closing an electric circuit formed by the conductor wires 44, the pawl is attracted and is released from the gear 37 so that the clockwork mechanism is free to rotate, and through the instrumentality of the gear 38 rotate the driving shaft 33. When this driving shaft is rotated, any particular ribbon may be actuated by rocking its toothed spool into engagement with the adjacent gear 35.

For actuating the ribbons independently of each other, a circular base board 45 is fixed to the bottom of the casing and upon this base board is fixed a concentric annulus 46. Pivoted intermediate their ends upon the edge of this annulus is a plurality of levers 47, these levers normally being held extending radially from the center of the base board by helical springs 48 which hold the edges of the levers pressed firmly against stops 49 arranged upon the edge of the annulus, the terminal convolution of one spring being fixed to the stop of the next adjacent lever as shown at 50. A plurality of sheaves 51 is arranged upon the base board in alinement with the levers and over these sheaves are trained cords 52, one end of each cord being connected to the lever next in rear of the sheave and the opposite end of each

cord being connected to an eye 53 fixed to the bridge piece 26 of one of the hangers, the intermediate portion of each cord being trained over a sheave 54 fixed to the rear wall of the casing. A stub shaft 55 is mounted centrally upon the base board and is equipped at its outer end with a cam 56, this cam being in the nature of a single rod which when the shaft is rotated impinges against the inner ends of the levers 47 and trips each lever separately. As each lever is tripped, the cord carried by that lever is pulled and the hanger connected to the cord is rocked in the direction of the driving shaft 33 so that the toothed spool carried by this hanger will be brought into mesh with the adjacent driving gear 35.

For actuating the cam, a clockwork mechanism 57 is employed, the clockwork mechanism operating to drive the shaft 55, and one end of this shaft is equipped with a ratchet wheel 58, a spring controlled pawl 59 being arranged below this ratchet and being normally held in engagement therewith. An electro-magnet 60 is arranged adjacent to the pawl and when excited by an electric circuit formed by the conductor wires 61 attracts this pawl, thereby releasing it from engagement with the ratchet so that the clockwork mechanism is free to turn the cam.

Suppose the station agent at Alliance has been notified by telegraph that train No. 44 has arrived at Edgemont while traveling in the direction of Alliance, the agent closes the circuit that excites the magnet 43 so that the spring pawl 40 is drawn down and allows the clockwork mechanism 36 to actuate the driving shaft 33. The agent now closes the circuit that excites the magnet 60, the spring pawl 59 being thus drawn down from the ratchet wheel 58 and permitting of the clockwork mechanism 57 to rotate the cam 56. When the cam has reached the particular lever that rocks the hanger of the toothed spool carrying the endless ribbon on which the marker "44" is fixed, the operator opens the circuit at the instant when the cam has operated to depress said lever, the cord attached to this lever being thus pulled operating to rock the toothed spool into mesh with the adjacent gear carried by the driving shaft. Each of the levers which the cam 56 must pass before it reaches the particular lever wanted, will be momentarily rocked on its pivot, this momentary rocking of the lever also rocking the corresponding hanger into contact with the actuating shaft, but this contact will not be maintained a sufficient length of time to amount to an appreciable actuation of the ribbons carried by the spools of the hangers thus actuated. The ribbon trained upon the spool which is maintained in contact with

the driving shaft as above described, will now travel since as above stated, the driving shaft has been actuated by the exciting of the magnet 43, and when the marker 5 "44" has come into alinement with the designation plate marked Edgemont, the operator again closes the circuit that actuates the magnet 60 so that the cam is advanced beyond the lever, and when the latter 10 springs back to its normal position, thus slackening the cord, the hanger carried by the cord immediately assuming its normal position. The toothed spool carried by the hanger upon the latter assuming its normal position will be rocked free from engagement with the driving shaft gear. The circuit is again opened when the cam has advanced beyond the lever, thus permitting of the cam coming to rest between adjacent 20 levers. The agent now opens the circuit that excites the magnet 43 so that the clockwork mechanism is stopped and the driving shaft stopped. This operation is repeated when the station agent at Alliance has been notified that the train has advanced to the station marked Ardmore, and at each successive station until the train has reached Alliance. Thus the agent may know from a glance at the board just what station any 30 particular train has last been reported at. In order to bring each marker back to its starting position, it will be simply necessary to cause the rotation of the cam finger into engagement with the actuating lever of the desired marker, this engagement being maintained during a sufficient length of time to cause the ribbon to travel upon the rotating spool until it reaches its initial or starting position when the cam finger may 40 be released from its engagement with the lever.

It is desirous to know when the clockwork mechanisms above described have run down, and to provide for this a push button 62 is arranged to be depressed by the main spring 63 of each clockwork mechanism when the spring has become expanded. The push button closes an electric circuit which excites an electric bell 64, this electric bell 50 constituting audible means for notifying the station agent when the clockwork mechanisms have become run down.

As above described the movements of a train running from Edgemont to Alliance have been traced, in which instance the marker ribbon designating the train has traveled upwardly on the face of the register. Now in order to trace the movements of a train running in the opposite direction that is from Alliance to Edgemont, the above described mechanism is employed, with the exception that interposed between the ribbon spool gears 28 and driving shaft and gears 35 are pinions 65, these pinions during

the rotation of the driving gears causing 65 the spool gears to rotate in such a direction as to move the ribbons carried thereon downwardly upon the face of the indicator, and thus carry the train markers thereon in registration successively from the stations, 70 Alliance to Edgemont. It will be noted that the U-shaped hangers in this instance are made slightly greater in length than the hangers above described.

In order to insure the spool hangers being 75 rocked outwardly so as to positively disengage the spool gears from the driving gears, spiral strings 66 are connected to the hangers and to the opposing front wall of the casing. 80

What is claimed is:—

1. A train indicator including a support, a series of spaced station designating characters thereon, a driving shaft, a spool mounted for swinging movement adjacent 85 to said shaft, a spring controlled lever, a flexible connection between said lever and said spool to swing the spool into operative engagement with said shaft when the lever is actuated, a rotary cam operating to actuate the lever, a means for rotating said cam, and an endless ribbon trained over said spool carrying a train designating character, said character being advanceable into registration with said train designating 90 characters by said ribbon during rotation of said spool by said shaft. 95

2. A train indicator including a support, a series of spaced station designating characters thereon, a driving shaft, a clock work 100 mechanism driving said shaft, a swinging spool operatively engaging with and rotating with said shaft when swung to its limit of movement in one direction, and being normally held out of engagement with said 105 shaft, a spring controlled pawl normally holding said mechanism quiescent, an electro-magnet for releasing the pawl to permit of rotation of said shaft, an endless ribbon trained over said spool carrying a train 110 designating character, and means for moving said spool into operative engagement with said driving shaft whereby to actuate said ribbon and move said train designating character into alinement with said station 115 designating characters.

3. A train indicator including a support, a series of spaced station designating characters thereon, a swinging spool a driving shaft having an operative connection for 120 rotating said spool when the latter is swung to one limit of its movement, means for rotating said shaft, an endless ribbon trained over said spool carrying a train designating character, said train designating character 125 being advanceable into alinement with said station designating characters during actuation of said ribbon by said spool, and

means for swinging said spool into operative engagement with said driving shaft consisting of a supporting member, a spring controlled lever pivoted intermediate its
3 ends on said supporting member, a connection between one end of said lever and said spool, a rotary cam finger engageable with the opposite end of said lever and rocking said lever on its pivot whereby to actuate

said connection and rock the spool, and 10 means for rotating said cam finger.

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

EUGENE W. COLE.

Witnesses:

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J. A. STEWART.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
