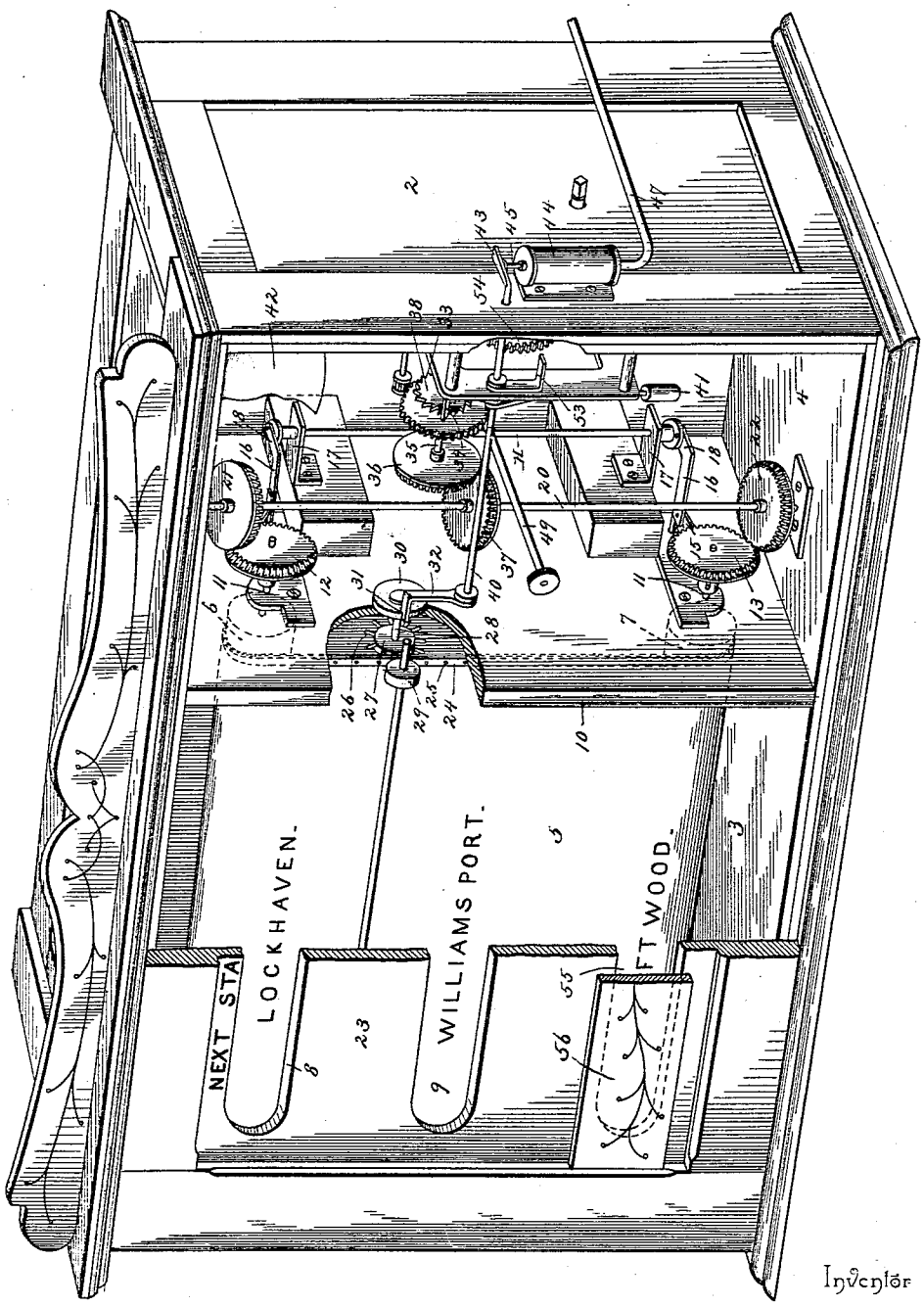
(No Model.) 2 Sheets—Sheet 1.

F. W. AYERS.

STATION INDICATOR.

No. 557,635. Patented Apr. 7, 1896.

FIG. 1.



Inventor

Frank W. Ayers.

By his Attorneys.

C. A. Snow & Co.

Witnesses

Harry L. Amer.

V. B. Hillyard.

(No Model.) 2 Sheets—Sheet 2.

F. W. AYERS.

STATION INDICATOR.

No. 557,635. Patented Apr. 7, 1896.

FIG. 6.

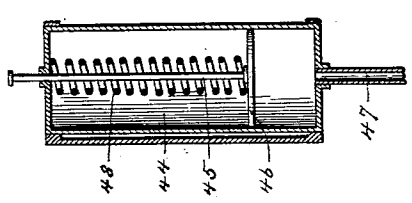


FIG. 3.

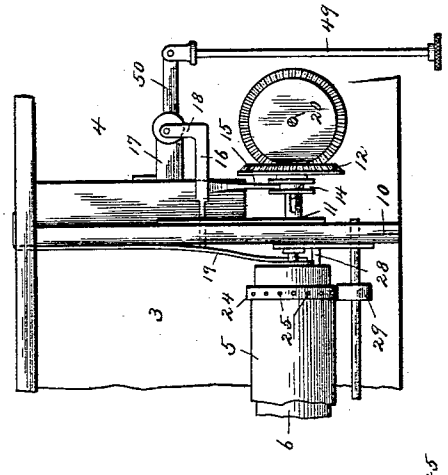


FIG. 4.

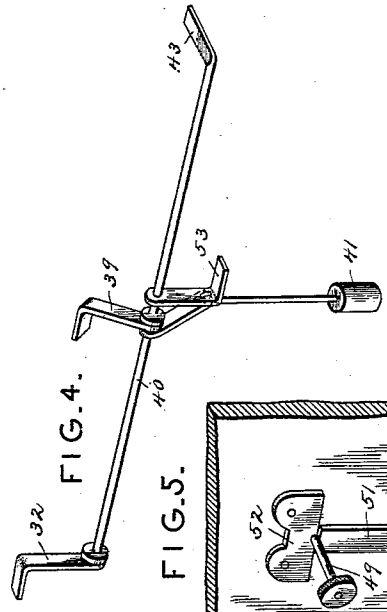


FIG. 5.

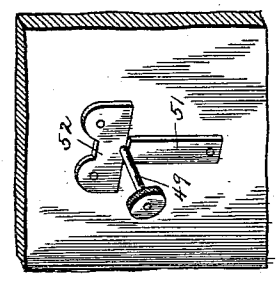
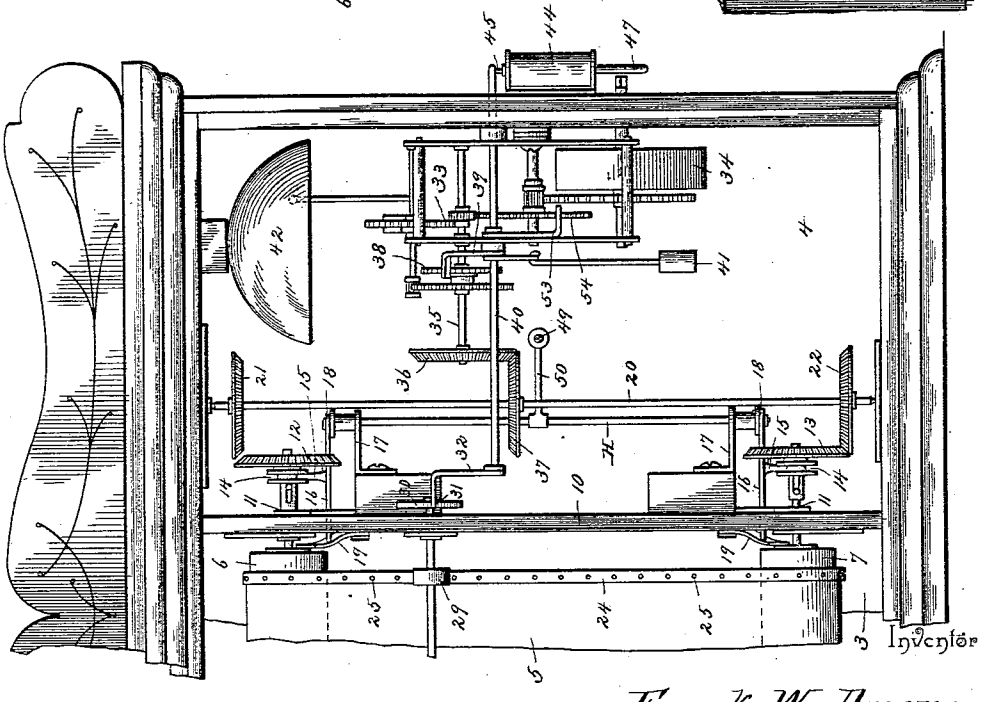


FIG. 2.



Witnesses
Harry L. Amer.
V. B. Hillyard.

Inventor
Frank W. Ayers.
By His Attorneys,
C. A. Snow & Co.

ANDREW B. GRAHAM, PHOTO-LITHO. WASHINGTON, D.C.

UNITED STATES PATENT OFFICE.

FRANK W. AYERS, OF JOHNSONBURG, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO ELLSWORTH E. WOOD, OF SAME PLACE.

STATION-INDICATOR.

SPECIFICATION forming part of Letters Patent No. 557,635, dated April 7, 1896.

Application filed March 11, 1895. Serial No. 541,336. (No model.)

To all whom it may concern:

Be it known that I, FRANK W. AYERS, a citizen of the United States, residing at Johnsonburg, in the county of Elk and State of Pennsylvania, have invented a new and useful Station-Indicator, of which the following is a specification.

The object of the present invention is the provision, in a single organized structure, of means for automatically and with precision displaying the names of stations along a line of railway, thereby informing passengers of the name of the station at which the car or train has arrived, and at the same time exposing the name of the next station, so as to give timely warning to those passengers who may desire to leave the car or train at the next station.

An essential feature of the invention is the reversing mechanism, whereby the rollers upon which the belt or canvas carrying the names of the various stations is thrown in and out of gear, the roller ungeared from its rotating mechanism, having a tension applied thereto to prevent any slack or the too rapid paying off of the name-bearing belt or canvas.

Another important feature of the invention is to positively check the movement of the name-bearing belt the instant the proper name is exposed through the opening in the case of the indicator, and at the same time provide a means for checking the movement of the train of gearing, whereby movement is imparted to the rollers for actuating the name-bearing belt and moving it past the openings through which the names of the stations are disclosed.

The invention will be more fully understood from the subjoined description, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view of a station-indicator constructed in accordance with and embodying the essence of the invention, the cover to the compartment inclosing the actuating mechanism being removed and a portion of the cover for closing the compartment in which the name-bearing belt or canvas operates being broken away, a portion of the vertical partition being broken away to disclose the mechanism for controlling or checking the movement of the name-bearing belt. Fig. 2 is a front elevation of one end portion of the device, showing clearly the actuating mechanism for controlling the various movements of the parts. Fig. 3 is a plan view in detail of the shifting and tension mechanism for a roller upon which the name-bearing belt is wound. Fig. 4 is a detail perspective view of the counterbalanced shaft which is tripped for releasing the actuating mechanism, showing the relative disposition of the several arms for controlling the movements of the mechanisms whereby the name-bearing belt and the clock-movement are governed. Fig. 5 is a detail view of a portion of the cover for inclosing the compartment in which the actuating mechanism is located, showing the means for locking the reversing-rod in the located position. Fig. 6 is a detail view in section of the cylinder and the pipe for supplying the piston-operating medium, whereby the shaft is tripped for releasing the movement.

The casing 2 for containing the operating parts of the indicator may be of suitable size and pattern and is subdivided into two compartments 3 and 4. The compartment 3 contains the belt or canvas 5, upon which is printed the names of the stations along the line of travel, and the rollers 6 and 7, upon which the said canvas or belt 5 is wound to bring the names of the stations in order opposite the slots 8 and 9 in the cover, so as to expose them to the view of the passengers. The compartment 4 receives the actuating mechanism whereby movement is imparted to the rollers 6 and 7 and for reversing the movement of the canvas or belt 5. The rollers 6 and 7 are of ordinary construction and are journaled at their ends in a side of the case and in the partition 10, which divides the case into the compartments 3 and 4. The journals 11 of the rollers 6 and 7 project beyond the partition 10 and receive beveled gear-wheels 12 and 13, which are constructed to slide upon the said journals, but turn therewith when positively actuated, so as to impart a rotary movement to the said rollers for winding the belt or canvas 5 thereon. Each of these beveled gears 12 and 13 has a hub portion in which is formed an annular groove

14, into which extends the free end of an arm 15, carried by a rod 16, so as to move the said beveled gear on its journals to throw the rollers in and out of gear in the manner hereinafter to be fully set forth. A vertical shaft H, suitably journaled near its ends in brackets 17, secured to the partition 10, has an eccentric or crank 18 at each end, with which the rod 16 makes connection. The crank-arms 18, at the opposite ends of the shaft H, are disposed so as to occur at diametrically opposite points, so as to impart a reverse movement to the beveled gears 12 and 13. A tension-spring 19 is provided for each roller 6 and 7 and is adapted to be pressed upon by the end of the rod 16, which projects through the partition 10. This tension-spring 19 forms a brake and operates to check the free movement of the roller out of gear, thereby preventing the belt or canvas 5 from paying off or unwinding too freely from the said roller. A second vertical shaft 20, journaled in bearings provided at the top and bottom of the case, has beveled gear-wheels 21 and 22 at its opposite ends to mesh, respectively, with the beveled gear-wheels 12 and 13. This shaft 20 is operated by any suitable train of gearing or other motive power, so as to impart a rotary movement to the rollers 6 and 7 to wind up and move the belt or canvas 5 in the proper direction, according to the movement of the car or train.

The belt or canvas 5 may be of any suitable construction usually provided in this class of devices and has the names of the stations printed transversely thereof at proper intervals, so as to be brought in register with the openings 8 and 9 in the cover 23. The edge portions of the belt or canvas 5 are reinforced or thickened, as shown at 24, and are provided with a series of perforations 25 occurring at regular intervals, so as to receive the pins 26 of a controlling-wheel 27. There are two of these controlling-wheels 27, one for each edge of the canvas 5, and they are mounted upon a transverse shaft 28. A resistance-roller 29 is located opposite and acts, in conjunction with each controlling-wheel 27, to insure engagement of the pins 26 with the openings 25. These resistance-rollers 29 are idlers, and between them and the controlling-wheels 27 the canvas or belt 5 passes. A disk 30 is provided on the inner end of the shaft 28 and has a notch 31 in its peripheral edge to receive the bent end of an arm 32, by means of which the movement of the said shaft 28 is stopped the instant the name of the station comes opposite the slot or opening in the cover 23.

The reference-numeral 33 indicates a suitable train of gearing or motive power, by means of which the parts are set in motion to operate the belt or canvas 5. As shown, this train of gearing 33 approximates the movement of a clock or similar mechanism, the initial power being derived from a coil-spring 34 in the well-known manner. A shaft 35 is suitably geared with the post or arbor upon which the coil-spring 34 is mounted, so as to be rotated therefrom. A beveled gear-wheel 36 on the end of the shaft 35 meshes with a corresponding gear-wheel 37 on the shaft 20 and transmits motion to the latter shaft when it is desired to operate the canvas or belt 5. A toothed wheel 38 is keyed upon the shaft 35 and is adapted to be engaged by the bent end of an arm 39, mounted upon a shaft 40. This arm 39 is weighted, as shown at 41, to cause its automatic engagement with the toothed wheel 38 when said shaft 40 is released from the influence of the disk 30.

A gong or alarm 42 is provided and sounds during the movement of the belt or canvas 5, so as to attract the attention of the passenger and inform him of the name of the next station. This alarm is suitably operated from the train of gearing in the ordinary manner of alarms provided for clock and other similar movements. The end of the shaft 40 is provided with an arm or lever 43, which is actuated by any convenient means to allow the actuating mechanism to move the belt 5, so as to expose the proper name of the station through the opening in the casing.

For street-railway cars and similar vehicles and public conveyances the ordinary bell-pull cord or other convenient means may be provided and attached to the arm 43 so as to turn the shaft 40 and disengage the bent end of the arm 32 from the notch in the check-wheel 30 and at the same time disengage the bent end of the arm 39 from the toothed wheel 38, so as to permit the movement, and on the release of the cord to stop and check the position of the belt, whereby the proper name of the required station is exposed through the opening in the casing.

For steam-railway cars and others propelled by steam, compressed air, and like motive power a cylinder 44 will be provided and located so that the stem 45 of its piston 46 will engage with the arm 43 and allow the actuating mechanism of the indicator to move. A pipe 47 will communicate with the lower end of the cylinder and be under the control of the engineer or conductor, so as to supply the steam, compressed air, or other fluid to the cylinder to actuate the piston when it is required to change the name of the station exposed to view. A retracting-spring 48 is located in the upper end of the cylinder and confined between the piston 46 and the head of the said cylinder, so as to act in opposition to the steam or other operating fluid, so that when the latter is shut off the said spring 48 will regain itself and return the parts to a normal position.

From the foregoing description it will be seen that when the shaft 40 is turned so as to release the arms 32 and 39 from the wheels 31 and 38 the movement will operate, and by means of the mechanism hereinbefore specified will sound the alarm 42 and rotate the

shaft 20. Inasmuch as only one of the rollers 6 and 7 is in gear with the shaft 20 at the same instant, it is manifest that the roller so geared is the one which will receive positive movement. The shaft 40 having been set in motion will be held in such relative position that the bent end of the arms 32 and 39 will be out of active operation by means of the bent end of the arm 32 riding upon the periphery of the disk 30. The instant the notch 31 comes opposite the bent end of the arm 32 the weight 41 will cause the bent end of the arm 32 to enter the notch 31, and at the same time the arm 39 will engage with the wheel 38 and check the movement of the train of gearing 33. It will be seen that the movement of the belt or canvas 5 and the train of gearing 33 is checked at the same instant. Hence there can be no straining of the actuating mechanism. After the car or train has reached the end of its travel the roller 6 or 7, previously out of gear, will be now brought into gear, so as to reverse the movement of the belt on the return trip of the car. This is effected in a convenient manner by means of a rod 49, connected at its inner end with an arm 50 on the shaft H and having its front end portion projected through the casing, so as to be readily accessible to reverse the motion of the belt 5. Any convenient locking mechanism may be provided to secure the rod 49 in the located position. As shown, a plate 52 is firmly attached to the cover of the case and is notched in its edge for the passage of the said rod 49, and a latch 51 is pivoted to the said cover and acts in opposition to the plate 52 to bind or grip the rod 49 and secure the same in the required location.

While the construction and arrangement of the parts herein shown and described are preferred, it will be readily understood that changes in the form, proportion, and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

The shaft 40 is provided with an arm 53 to engage with a wheel 54 of the movement and hold the latter in check during the interval between the initial movement of the shaft 40 when tripped and the release of the same by cutting off the steam or releasing the pull-rope, by means of which the said shaft 40 is tripped. By this construction, if the shaft 40 is actuated and not instantly released, the arm 53, by engagement with the toothed wheel 54, will prevent any motion of the movement and will hold the latter motionless until the said shaft 40 is released from the means by which it receives its initial movement. Thus should the shaft 40 be tripped and held at the limit of its trip movement the operating parts of the device will not be actuated until the said trip mechanism is released.

On reference to Fig. 1 it will be seen that the cover 23 is provided near its lower end with an opening 55, which corresponds in shape to the openings 8 and 9. The opening 9 is centrally disposed, and the name of the station arrived at is disclosed through the said opening. The names of the next stations *en route* are exposed through either of the openings 8 or 55. When going in one direction, one opening, as 55, is concealed by a removable shutter 56, and the names of the stations are disclosed through the opening 8. On the return trip the shutter 56 is moved and arranged so as to hide the opening 8, thereby permitting the names of the stations in advance of the one arrived at to be exposed through the opening 55.

Having thus described my invention, what I claim is—

1. A station-indicator comprising the following instrumentalities: a belt bearing the names of the stations, rollers for the said belt to wind upon, a tension device for checking the speed of the roller out of gear, a reversing mechanism for alternately throwing the rollers in and out of gear and adapted to control the operation of the said tension device, an actuating mechanism for controlling the movement of the said rollers, a brake mechanism for checking the movement of the belt, a check device adapted to automatically stop the movement of the actuating mechanism when the required name of the station is properly exposed, and means for operating the said brake and check mechanisms, whereby the actuating mechanism is free to operate and move the said belt, substantially as described for the purpose set forth.

2. In a station-indicator, the combination with a belt bearing the names of the stations, rollers for the said belt to wind upon, and an actuating mechanism, of a reversing mechanism to alternately throw the said rollers in and out of gear, and tension devices controlled by the movement of the said reversing mechanism to retard the movement of the roller thrown out of gear, substantially as set forth.

3. In a station-indicator, the combination with a belt bearing the names of the stations, rollers for the said belt to wind upon, gear-wheels mounted upon the journals of the said rollers so as to rotate therewith, but free to move thereon, and a shaft adapted to be rotated by suitable mechanism and having gear-wheels to mesh with the gear-wheels on the journals of the said rollers, of a shaft adapted to be turned in its bearings and having connection with the said gear-wheels on the journals of the said rollers to impart a reverse movement to the said gear-wheels, and tension devices operated upon by the said connections whereby the roller out of gear has its movement checked, substantially as described for the purpose set forth.

4. In a station-indicator, the combination of a name-bearing belt having a line of perforations, rollers for the said belt to wind upon, actuating mechanism for alternately rotating the rollers in reverse directions, a controlling-pulley having a series of pins to

take into the line of perforations in the said name-bearing belt, a notched disk operatively connected with the said controlling-pulley, a counterbalanced shaft for starting and stopping the aforesaid actuating mechanism, an arm attached to the said counterbalanced shaft and constructed to travel upon the peripheral edge of the aforementioned controlling-pulley during the operation of the actuating mechanism and to engage with the notch thereof to stop the movement of the name-bearing belt and its actuating mechanism, and arms 39 and 53 secured to the counterbalanced shaft, the arm 39 holding the name-bearing-belt actuating mechanism in check and the arm 53 disposed to engage with the last-mentioned actuating mechanism to hold it in check during the interval between the initial movement of the said counterbalanced shaft when tripped and the release thereof, substantially as set forth.

5. In a station-indicator, the combination with a belt bearing the names of the stations, and rollers for the said belt to wind upon, of gear-wheels mounted upon the journals of the said rollers so as to move freely thereon but interlock therewith to cause the rollers and gear-wheels to rotate in unison, a shaft having arms connected therewith engaging with the said gear-wheels to move them on their journals in reverse directions, and a power-driven shaft having gear-wheels to be alternately engaged by the gear-wheels on the journals of the said rollers, substantially as set forth.

6. In a station-indicator, the combination with a belt bearing the names of the stations, an actuating mechanism for controlling the movements of the indicator, a mechanism for checking the movement of the said belt at the proper time, and comprising a disk having a notch in its peripheral edge, and a shaft to be tripped to start the actuating mechanism, and provided with three arms, one arm adapted to stop the movement when the required name is exposed, a second arm adapted to enter the said notch in the disk for stopping the movement of the name-bearing belt, and the third arm constructed to hold the actuating mechanism in check during the interval between the initial movement of the trip mechanism and the release thereof, substantially as described for the purpose set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

FRANK W. AYERS.

Witnesses:
HARRY SMITH,
SYBILLA SMITH.