No. 774,137. PATENTED NOV. 1, 1904.

A. GARABEDIAN.

AUTOMATIC STREET OR STATION INDICATOR FOR STREET RAILWAY CARS, &c.

APPLICATION FILED MAY 5, 1904.

NO MODEL. 2 SHEETS—SHEET 1.

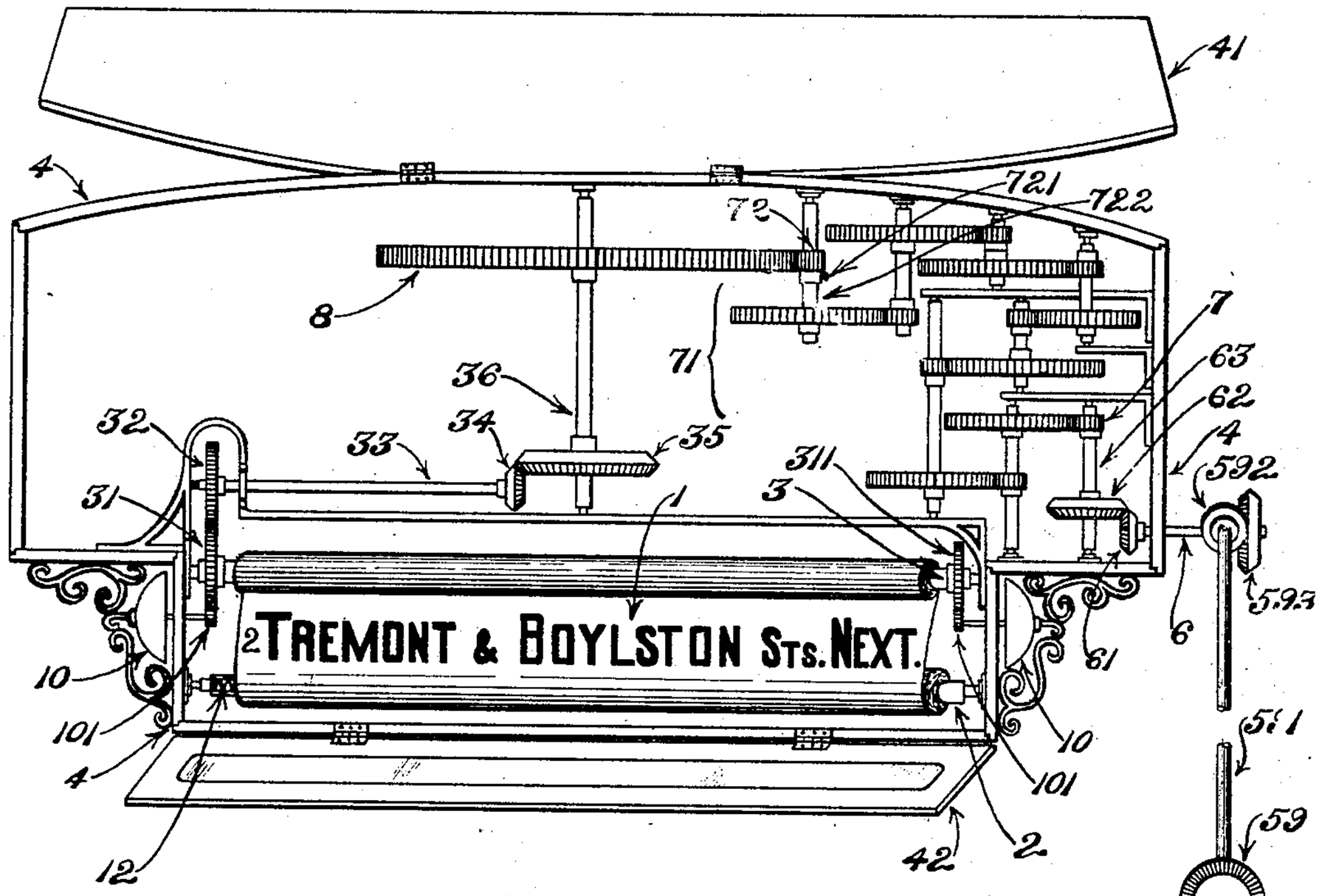

Fig. 1.

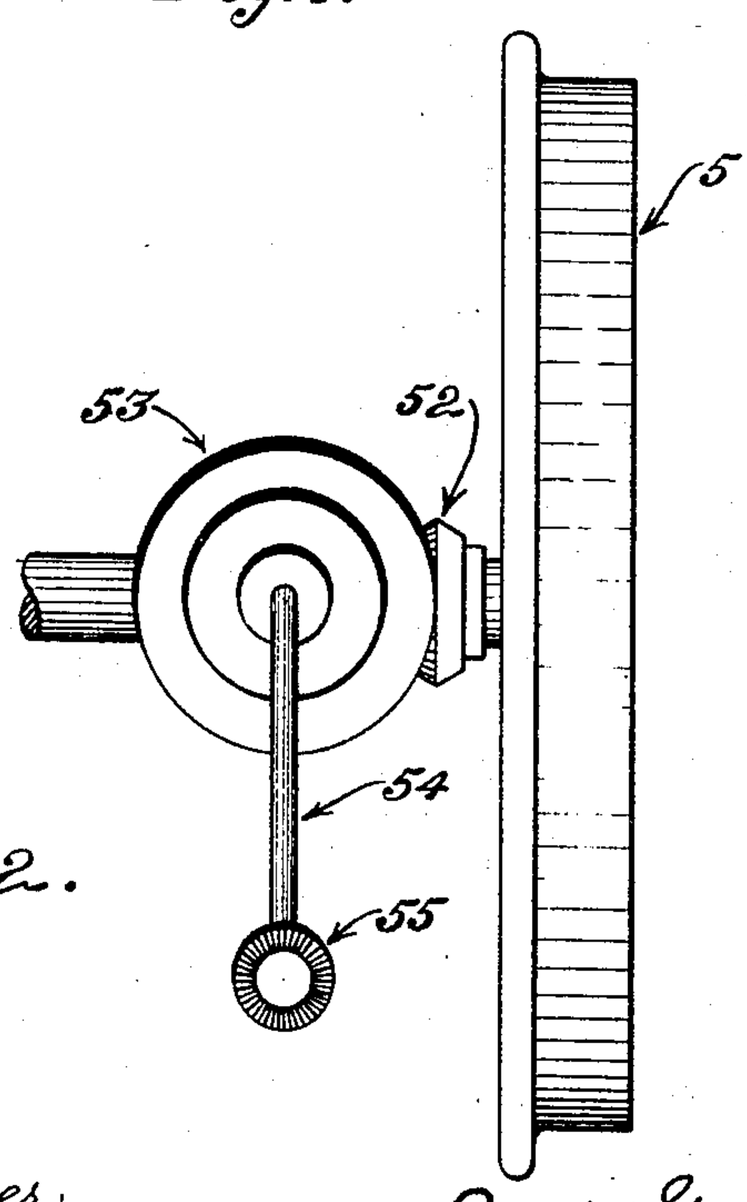

Fig. 2.

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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 3.

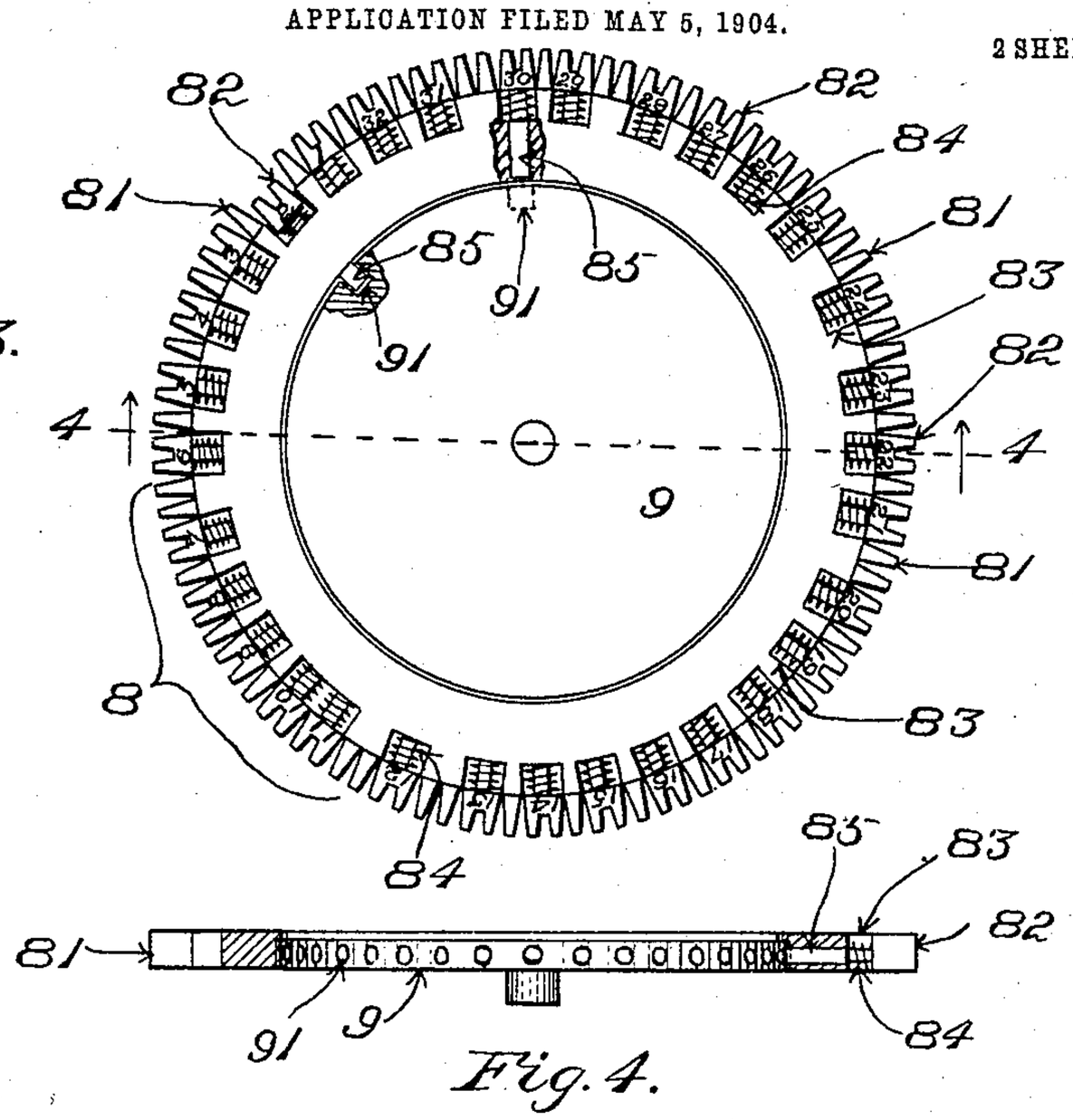

Fig. 4.

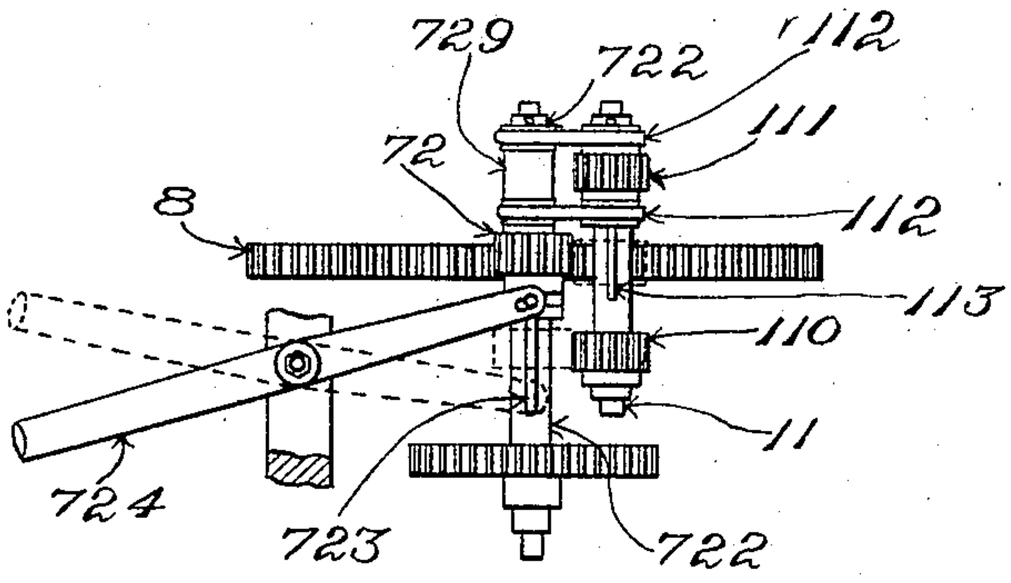

Fig. 5.

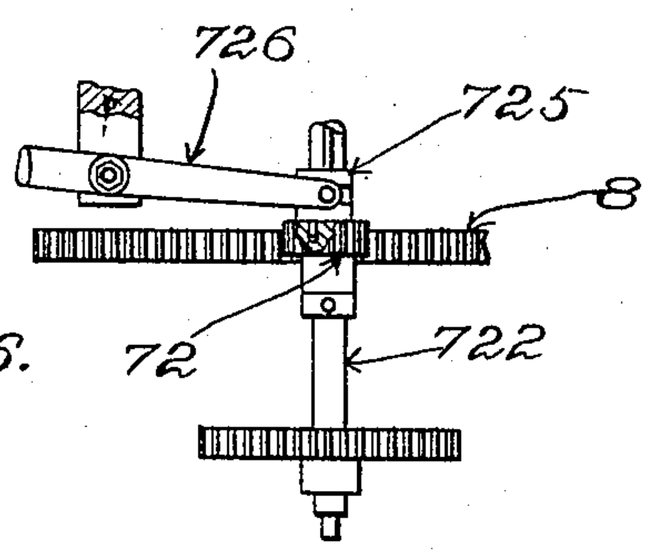

Fig. 6.

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No. 774,137. Patented November 1, 1904.

UNITED STATES PATENT OFFICE.

AGOP GARABEDIAN, OF BOSTON, MASSACHUSETTS.

AUTOMATIC STREET OR STATION INDICATOR FOR STREET-RAILWAY CARS, &c.

SPECIFICATION forming part of Letters Patent No. 774,137, dated November 1, 1904.

Application filed May 5, 1904. Serial No. 206,471. (No model.)

To all whom it may concern:

Be it known that I, AGOP GARABEDIAN, a Turkish subject, residing at Boston, in the county of Suffolk, State of Massachusetts, have invented a certain new and useful Improvement in Automatic Street or Station Indicators for Street-Railway Cars and the Like, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention consists in an improved apparatus or device of novel character and construction for use on street-railway cars and the like for the purpose of visually indicating in due time and succession the names of the different streets or stations at which stops are made.

I have shown in the accompanying drawings the essential features of my said apparatus or device, and I will now proceed to describe the latter with reference to the said drawings, in which—

Figure 1 shows in elevation my indicator with the doors of its casing swung open, so as to display the interior mechanism, the said figure also showing a portion of the motion-transmitting train, which is in communication with a rotating wheel of the vehicle to which the apparatus or device is applied. Fig. 2 shows in plan detached a rotating wheel such as aforesaid and the remainder of the said train. Fig. 3 shows in plan, with small portions broken away to illustrate interior construction, the periodic clutch, by means of which the times of movement of the indicating-surface are controlled. Fig. 4 is a partly-sectional edge view showing the essential features of the said periodic clutch. Fig. 5 is a detail view showing the application of the reversing shaft and pinions, to which reference is made hereinafter. Fig. 6 is a detail view of a modification containing a clutch and clutch-shipper.

Having reference to the drawings, at 1 is shown an indicator-sheet, it bearing upon the surface thereof the names of the streets or other stations which are passed by the vehicle to which the indicating apparatus is applied, the said names appearing upon the said sheet in due order of succession. The opposite ends of the said indicator-sheet are connected, respectively, with the carrier-roll 2 and the receiving-roll 3. At the outset the indicator-sheet is wound upon the carrier-roll 2, and it is gradually unwound from the latter and wound upon the receiving-roll 3 by the rotary motion which is automatically communicated to the latter in the manner which will presently be explained. The rolls 2 and 3 are removably mounted in convenient manner within the framing or casing 4 of the apparatus or device, and with the receiving-roll 3 is combined the mechanism by means of which the required rotary movement is communicated thereto. In the present instance a spur-gear 31 is in operative connection with one of the journals of the receiving-roll 3, the said spur-gear being in mesh with a like gear 32, which is fast on the outer end of a horizontal shaft 33, the said shaft 33 having affixed to its inner end a bevel-gear 34, that meshes with a bevel-gear 35 on an upright shaft 36. The shafts 33 and 36 are journaled in suitable bearings with which the casing or framing 4 is provided. The shaft 36 is combined with a wheel, as 5, Fig. 2, pertaining to the vehicle in which the apparatus or device is employed and rotated through rolling upon the track for the said vehicle, the whcel 5 being connected with the shaft 36 through the medium of a motion-transmitting train, a speed-reducing train, and a periodic clutch, as I now will proceed to explain. By simply rolling upon the track the wheel 5 turns only in proportion to the distance which is traveled by the vehicle, and thus by the number of its revolutions serves to correctly measure such distance. The bevel-gear 52 is fast upon the said axle or otherwise connected to turn in unison with the wheel 5. 53 is a bevel-gear meshing with the bevel-gear 52 and fast upon the lower end of an upwardly-extending shaft 54, the latter carrying at the upper end thereof a bevel-gear 55, which is caused in practice to mesh with a bevel-gear 56 on a shaft 57, carrying a second bevel-gear 58, meshing with a bevel-gear 59 on a third shaft 591, the said shaft 591 having a second bevel-gear 592, meshing with a bevel-gear 593 on a shaft 6, extending at one end thereof within

the framing or casing 4. Through the medium of the motion-transmitting train, comprising the bevel-gearing and shafting just described, motion is transmitted from the wheel 5 to the mechanism that is contained within the framing or casing 4. Upon the inner end of the shaft 6 is fast a bevel-gear 61, meshing with a bevel-gear 62, fast upon a shaft 63, the latter shaft carrying a pinion 7, constituting the first wheel of a speed-reducing train 71, the last wheel of which is a spur-pinion 72, engaging and driving the wheel 8 of the periodic clutch, which is employed in connection with the shaft 36, to which reference has been made.

The wheel 8 is furnished at its periphery with teeth which are engaged by the teeth of the spur-pinion 72, and through such engagement rotary movement is communicated to the wheel 8. The wheel 8 is mounted to turn at times independently with respect to the shaft 36, and in connection with the said wheel and shaft I provide devices by means of which the two are temporarily clutched together periodically to cause the shaft to participate in the movement of the wheel to the extent requisite to advance the indicating-sheet 1 sufficiently to present the name of the next street, station, or stop. In order to occasion the said clutching, the wheel 8 is furnished with fixed teeth, as 81, Figs. 3 and 4, alternating with radially-movable teeth, as 82, the radially-movable teeth being in pairs and each pair being mounted to move in unison within a socket 83 at the periphery of the body of the wheel 8. Each pair of the movable teeth is backed up by an expanding spiral spring 84, which is compressed between the bottom of the corresponding socket and the body of the said pair, and each pair is provided with an inward extension, projection, or pin 85. (See Figs. 3 and 4.) The wheel 8 consists of or is formed with an annulus or ring surrounding a clutch-disk 9, that is fast with the shaft 36, the said disk having a peripheral series of holes 91, as shown in Figs. 3 and 4, to receive the inner ends of the projections or pins 85 when the movable teeth 82 are pressed inwardly. By the action of the springs 84 the movable teeth 82 are normally held pressed outward radially, and in this position of the said movable teeth the inner ends of their projections or pins 85 occupy positions outward beyond the periphery of the clutch-disk 9, as in the case of the uppermost projection or pin of Fig. 3 and the right-hand one of Fig. 4. So long as all of the movable teeth and their projections or pins occupy their outer positions the wheel 8 and disk 9 are unclutched from each other, and no movement is transmitted from the wheel 8 to the indicator-sheet. When, however, one of the pairs of movable teeth is pressed radially inward, as at the left hand in Fig. 3, its projection or pin will enter one of the holes 91 and will thereby clutch the wheel 8 to the disk 9, so as to carry the said disk around in unison with the wheel 8 until the projection or pin is permitted to be withdrawn from the hole. Thereby movement will be transmitted through the intermediate gearing to the receiving-roll 3 to advance the indicator-sheet 1. The clutching action is occasioned automatically and through the action of the teeth of the spur-pinion 72 upon the movable pairs of teeth 82 as the respective pairs are successively presented for engagement with the teeth of the said spur-pinion in the rotation of the wheel 8, which is occasioned by the action of the spur-pinion. To this end the space between the two teeth of each of the movable pairs is less in depth than the radial length of the respective teeth of the spur-pinion 72. Consequently the tooth of the said spur-pinion which enters the space between the teeth of a movable pair presses by its outer end or face against the bottom of the space, and thereby pushes the movable pair of teeth radially inward toward the center of the wheel 8. This inward movement of the movable pair of teeth causes the projection or pin 85 of such pair to enter one of the holes 91 of the disk 9, thus effecting the temporary clutching of the wheel 8 and disk 9 to each other. The receiving-roll 3 of the indicator-sheet 1 thereby is connected temporarily with the train 7 and is operated to effect the required extent of shift or change thereof. As the tooth of the pinion 72 is withdrawn by the rotation of the said pinion and the wheel 8 from the space between the two teeth of the pair of movable teeth which has been acted upon, as just described, the said pair of movable teeth is released to the action of its spring 84 and by the latter is pressed radially outward again, thereby withdrawing its projection or pin 85 from the hole 91 of disk 9, which received it, and unclutching the wheel 8 from the said disk, thus disconnecting the indicator-sheet from its actuating mechanism and arresting the advance thereof. In practice the number of fixed teeth 81 intervening between successive pairs of movable teeth will vary according as the distance between successive stations or stops varies. In Fig. 3 a single tooth is shown between successive pairs of movable teeth in some instances, and in other instances two fixed teeth are shown, it being supposed that in the case of these latter the distances separating stations or stops are correspondingly greater. In one instance two movable pairs of teeth are side by side. It will be clear that in each case the number of fixed teeth employed in a group will vary according to the distance to be traveled over between two successive stations or stops. For the purpose of audibly calling attention to a change in the position of the indicator-sheet bells or gongs 10 10 are provided, the striking arrangements thereof being provided with pinions 101, meshing, respectively, with the

gears 31 311, respectively, which are connected with the receiving-roll 3, as shown in Fig. 1.

The framing or casing 4 is furnished with upper and lower hinged sides or doors 41 42, which are shown swung into open positions in Fig. 1 of the drawings, so as to uncover the interior mechanism. The lower door 42, Fig. 1, is formed in part of glass, so that the indicator-sheet behind the same may be seen when the said door is closed.

My indicator may be mounted in any approved and convenient position within a car or the like, although I contemplate arranging the same to extend transversely across the upper part of the car or other vehicle at or near mid-length thereof. In this case the name of each station, street, or stop will be printed or otherwise produced upon both sides of the indicator-sheet, and a door 42 at each side of the framing or casing composed partly of glass, as aforesaid, will enable the indicator-sheet to be viewed from each end of the car or other vehicle.

In order to enable the movements of the indicator-sheet to be suspended whenever required, any ordinary clutching and shipping arrangement may be provided. In Fig. 1 the pinion 72 is fixed to its shaft 722 by means of a clamping-screw 721. By unscrewing the said clamping-screw the pinion 72 will be disconnected from the shaft 722, so that the latter may turn independently of the pinion 72. If desired, the pinion 72 may be connected with its shaft 722 by means of a spline 723, Fig. 5, with capacity to be shifted lengthwise of the said shaft into and out of mesh with the teeth of the gear 8 by means of a shipper-fork 724, or a clutch 725 and clutch-shipper 726 may be combined with the pinion 72 and the shaft upon which it is mounted, as shown in Fig. 6. In case on arriving at the end of a trip of the car in one direction the car is caused to travel in the opposite direction other end first the devices which have been described will operate to rotate the receiving-roll 3 in the direction to unwind the indicator-sheet therefrom. In order that the indicator-sheet may be rewound upon the carrier-roll 2 as fast as it is allowed to unwind from the receiving-roll 3, I have in the present instance combined with the carrier-roll 2 a spring, as 12, Fig. 1, operating after the fashion of the usual spring of a shade-roller. In this manner the names of the streets, stations, or stops upon the indicator-sheet will be exposed to view in the reverse order during the return trip. In case the car at the end of its trip in one direction should be sent around a loop before starting in the opposite direction, so that in its return trip the same end of the car as before will be first or in the lead, it is necessary to employ a reversing device in connection with the actuating devices for the indicator-sheet if it is desired that the indicator-sheet shall be wound from the receiving-roll 3 to the carrier-roll 2 during the return trip. A suitable reversing device for the purpose is illustrated in Fig. 5. The said device comprises a shaft 11, carrying lower and upper pinions 110 111. The lower pinion 110 is fast upon the shaft 11 below the wheel 8. The upper pinion 111 normally is held in a position above the said wheel by means of one or more forks 112 or the like, which enter corresponding grooves in the sleeve or hub of the pinion 111 at one or both ends of the latter, the said fork or forks being secured to the sleeve or hub 729, with which the vertically-movable gear 72 is shown provided in Fig. 5. The shaft 11 is provided with a spline 113, permitting movement of pinion 111 lengthwise along the said shaft, while causing the said shaft and pinion to rotate in unison. As the parts are positioned in Fig. 5 the pinion 72 is in engagement with the wheel 8, and the latter is rotated in manner already described in the direction for advancing the indicator-sheet. When it is desired to reverse the direction of movement of the indicator-sheet, the pinions 72 and 111 are shifted upon their respective shafts far enough to place the pinion 72 in engagement with the pinion 110 of shaft 11 and the pinion 111 in engagement with the wheel 8. During the travel of the car motion will now be transmitted from the pinion 72 through the pinions 110 111 and shaft 11 to the wheel 8 in the direction which is the opposite of that in which the wheel 8 formerely was rotated, and thereby the receiving-roll 3 will be rotated in the direction to unwind the indicator-sheet therefrom. It will be understood that the movement of pinion 72 along shaft 722 for the purpose of disengaging the said pinion from the wheel 8 in order to arrest the movement of the latter is not sufficient in extent to cause the said pinion to engage with the pinion 110, nor does the corresponding movement of the pinion 111 cause it to engage with the gear 8. When, however, the reversal of the direction of rotation of the wheel 8 is desired, the movement of the pinion 72 along its shaft 722 is made sufficiently great in extent to bring about the engagement of pinion 72 with the pinion 110 and of pinion 111 with gear 8, as explained above.

In order to facilitate the application of the indicator-sheet 1 to the apparatus and its adjustment in proper relationship with the actuating mechanism therefor, the successive portions of the same bearing the names of streets, stations, or other stops are numbered consecutively, as shown at the left-hand margin of the same in Fig. 1, and corresponding numerals are applied to the respective pairs of movable teeth, as will be seen in Fig. 3. The numbers upon the said movable teeth assist in making application of the movable teeth to the wheel 8 in assembling the mechanism or in making repairs.

By way of illustration, the portion of the indicator-sheet which is exposed to view in Fig. 1 bears the numeral 2, which latter is also borne by the inwardly-pressed movable tooth at the left-hand side in Fig. 3, the said tooth being represented as having clutched the wheel 8 to the disk 9.

I claim as my invention—

1. In an automatic street or station indicator for street-railway cars and the like, in combination, a wheel rolling upon the track and thereby caused to revolve, an indicator-surface, and a motion-transmitting train between the said wheel and the said indicator-surface embracing a pair of intermeshing gears, one thereof normally loose or disconnected and having in connection therewith means operated by the other thereof to couple or connect said loose gear with the remainder of the said train to render the latter operative to actuate the said indicator-surface.

2. In an automatic street or station indicator for street-railway cars and the like, in combination, the indicator-surface, and an operating-train of mechanism for actuating the said surface, the said train embracing the wheel 8 with its movable clutch-actuating teeth, the clutch-disk coacting with the said teeth, and the pinion 72 engaging the wheel 8 and operating the said clutch-actuating teeth thereof.

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

AGOP GARABEDIAN.

Witnesses:
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WILLIAM A. COPELAND.