Sept. 4, 1923. **1,466,776**

F. G. WHITE

SIGNBOARD

Filed March 26, 1921 3 Sheets-Sheet 1

Fig. 1.

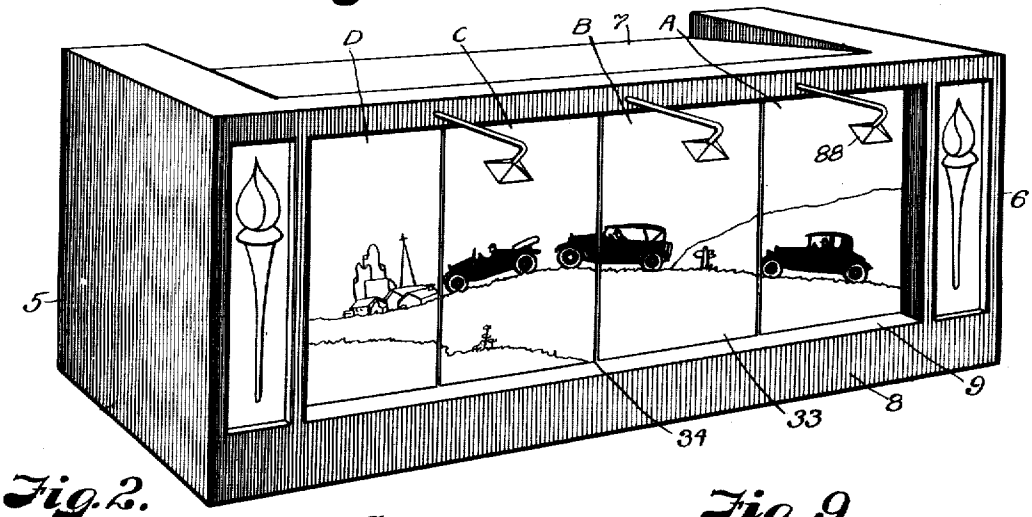


Fig. 2.

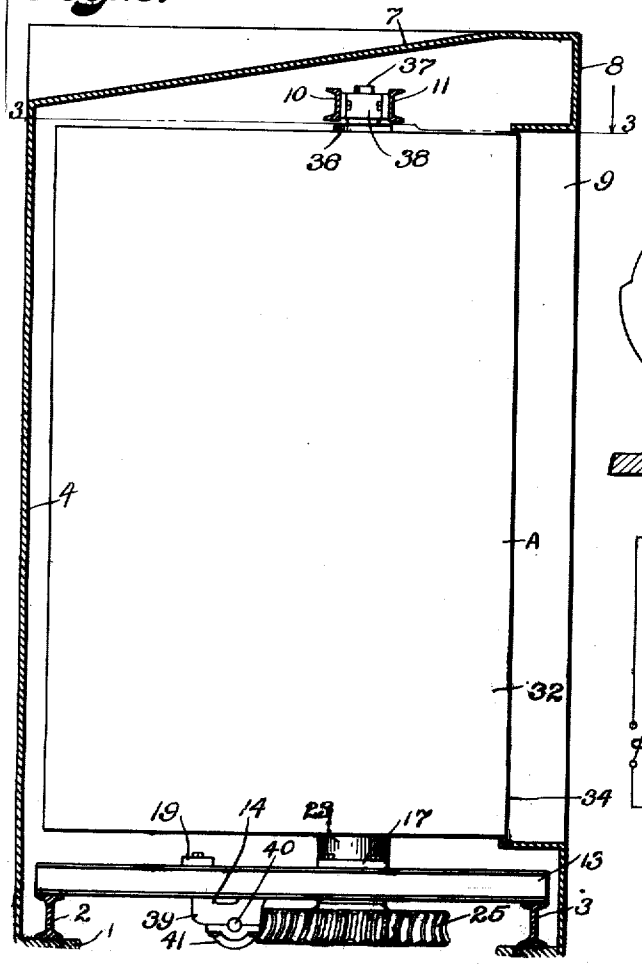
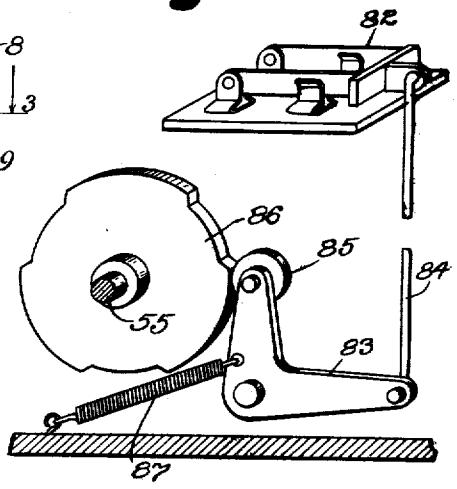


Fig. 9.



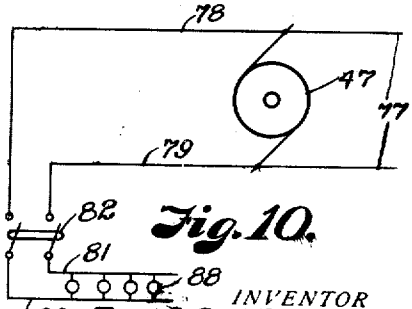


Fig. 10.

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Sept. 4, 1923. 1,466,776

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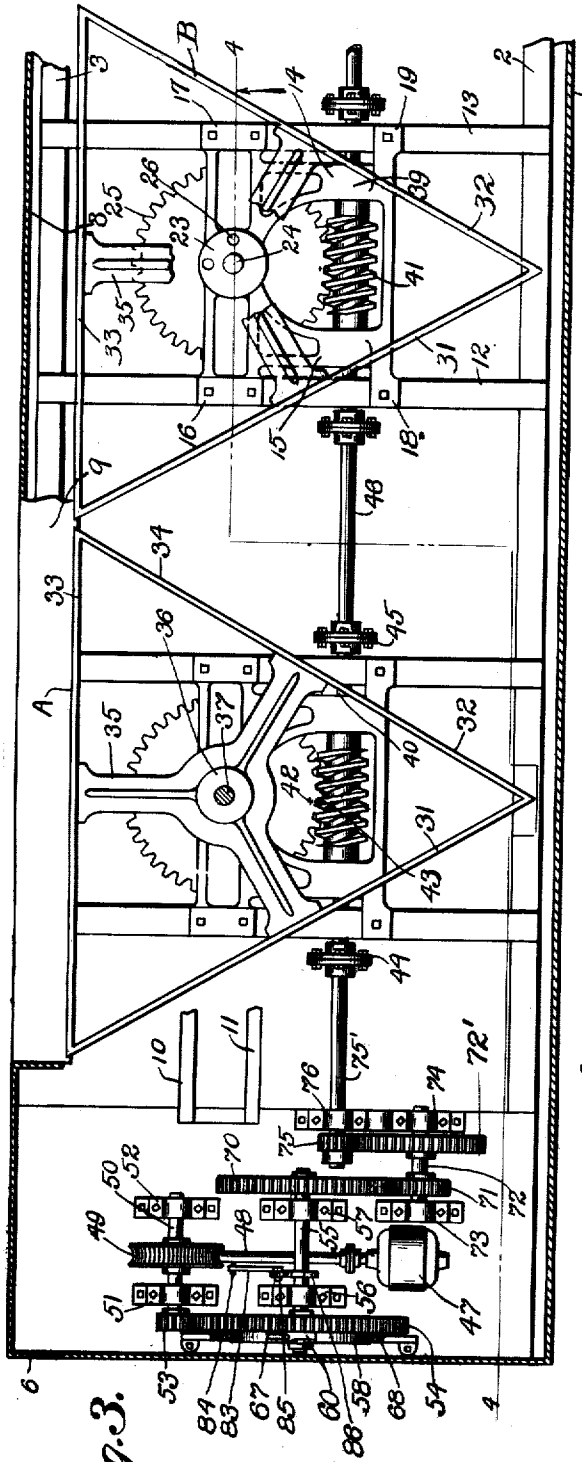


Fig. 3.

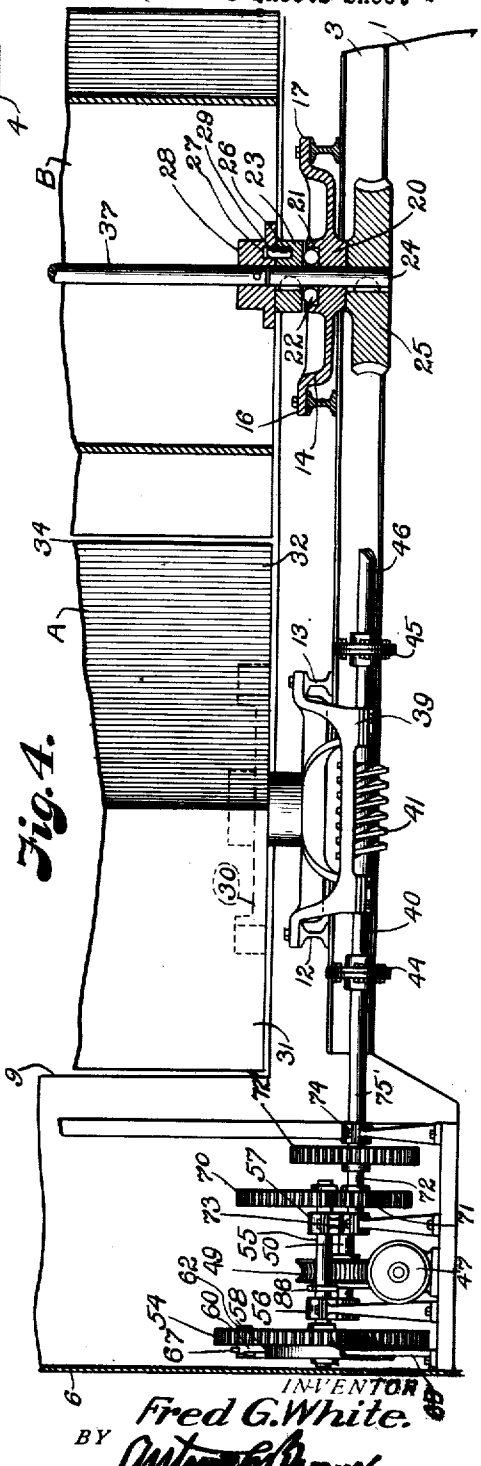


Fig. 4.

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SIGNBOARD

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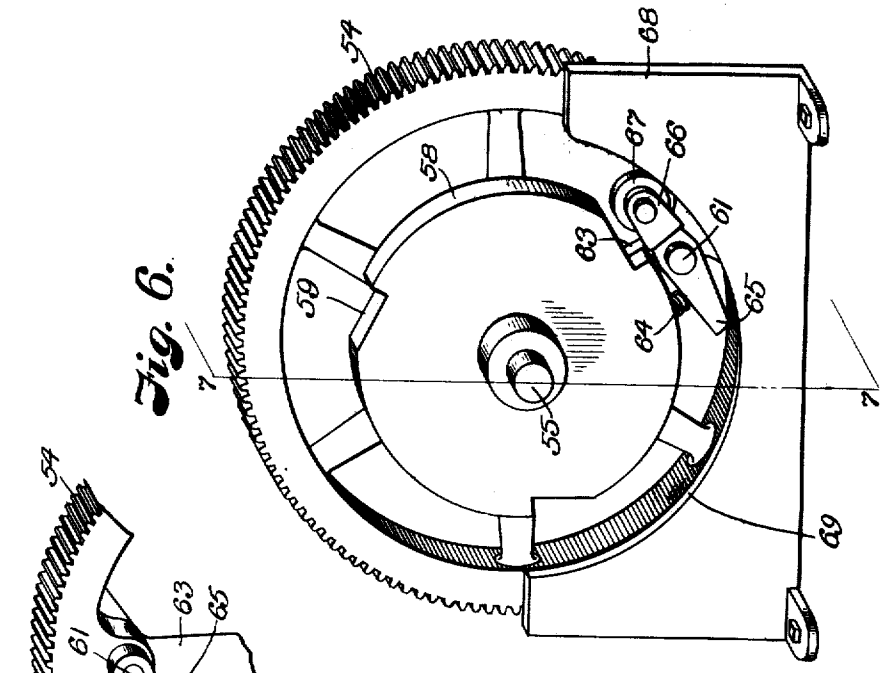


Fig. 6.

Fig. 8.

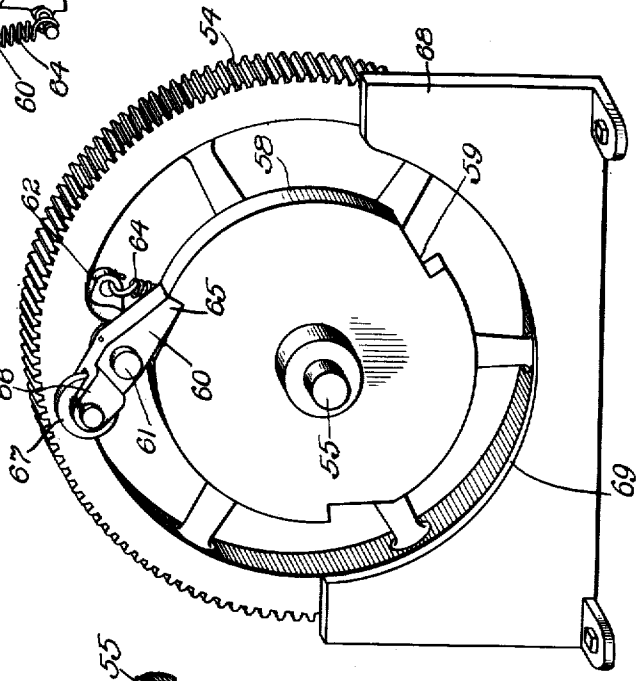


Fig. 5.

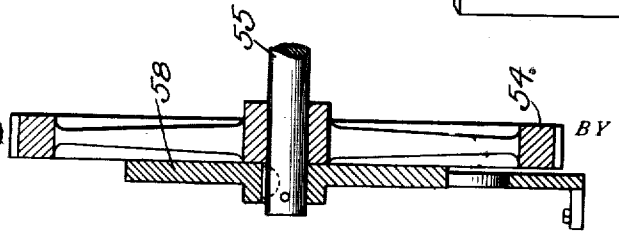


Fig. 7.

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BY Arthur O'Brien
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Patented Sept. 4, 1923. 1,466,776

UNITED STATES PATENT OFFICE.

FRED G. WHITE, OF KANSAS CITY, MISSOURI, ASSIGNOR TO LEWIS R. LONG, OF KANSAS CITY, MISSOURI.

SIGNBOARD.

Application filed March 26, 1921. Serial No. 455,884.

To all whom it may concern:

Be it known that I, FRED G. WHITE, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in a Signboard; and I do 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, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to signs and particularly to an automatically changeable sign in which a plurality of separate sign units may operate in unison at intermittent periods to render different indicia visible so that reading matter or indicia rendered visible will be changed from time to time.

The invention is illustrated as consisting of a plurality of rotatable triangular sign frames or units, on each face of each of which is suitable indicia, the triangular signs or frames being arranged so that one face of each frame will align with a face on another triangular frame.

The triangular frames or units are so arranged that the movement of one frame will synchronize with that of all of the others so that mating faces of the triangular frames will be presented in alignment without liability of the edge of one face overlapping the edge of the other face.

An important feature of my invention contemplates the provision of means whereby each unit may be constructed as such and shipped to the point of destination where the respective units may be connected up to properly synchronize, the erection requiring no special knowledge of machinery.

Another important feature of my invention is the provision of means whereby the parts can be properly assembled, insuring the proper co-relation of each separate element of the complementary members so that the various elements which co-ordinate to produce the desired result may be correctly assembled to insure the proper synchronizing movements of the various units, it being understood that any number of units may be added to the first unit to make up the required sign surface to be exposed, the number of units being only limited by the capacity of the motor and the driving means for operating them.

It is also a feature of this invention to provide means whereby accidental or independent movement of any one unit with respect to another will be avoided, this being largely due to the construction of the lock driving means for each respective unit and to no small extent a result of the utilization of a worm drive for each unit, which has a dual function in that it not only serves as a drive but also as a locking means to insure that the unit will be maintained in its proper position and held against independent movement from any cause as, for example, against being rotated about its axis by winds, storms, etc., and also as well as to guard against overrunning due to inertia of the unit, which would have a tendency to occur because the drum, in actual practice, is of considerable weight.

In the drawings,

Fig. 1 is a perspective view of a sign constructed in accordance with my invention.

Fig. 2 is a transverse sectional view through the same.

Fig. 3 is a sectional view on the line 3—3 of Fig. 2, part of one of the drums being broken away to show the operating mechanism in plan.

Fig. 4 is a sectional view on the line 4—4 of Fig. 3.

Fig. 5 is a detail perspective view of the main drive wheel and an intermittently operating clutching and escapement device in functioning position for transmitting power to the units.

Fig. 6 is a similar view of the same out of functional position.

Fig. 7 is a sectional view on the line 7—7 of Fig. 6.

Fig. 8 is a detail fragmentary perspective view of part of the main drive wheel, showing the actuating arm for controlling the pawl for connecting the main drive wheel to the remainder of the power transmission means.

Fig. 9 is a detail perspective view of an automatic circuit controller or flasher, and

Fig. 10 is a light wiring diagram.

The illustrated embodiment of my invention is shown as consisting of a foundation 1, on which may be placed base rails 2 and 3, spaced apart and located at approximately the front and rear of the sign casing and within it. The sign casing may consist of

a back 4, ends 5 and 6 and a roof 7, the front 8 being provided with an open space 9, through which the respective units may be visible.

There are longitudinal top rails 10 and 11 adjacent to the roof portion 7, which constitute supports for the top bearings for the shafts of the respective sign units. Each sign unit is shown as consisting of a pair of sills 12 and 13, on which is fastened a bearing casting and supporting bracket 14 comprising a central web 15 and sill-engaging flanges 16, 17, 18 and 19, the central web being offset with respect to the flanges, as clearly seen in Fig. 4, to lie between the top and bottom edges of the transverse sills 12 and 13.

Each web is provided with an upper or bearing portion 20 having a ball race 21 in which are anti-friction bearings 22. Resting upon the anti-friction bearings is a collar 23, keyed to a shaft 24 which extends through an opening in the hub 20 and which carries at its lower end a worm gear 25. The collar 23 is provided with one or more openings 26, which are eccentrically disposed in the upper face thereof and which are adapted to align with a mating opening or openings 27 in the spider 28, the openings 26 and 27 being designed to receive pins 29 so that the spider will be properly positioned with respect to the collar 23 in assembling the unit.

The spider 28 is provided with radial arms 30, preferably three in number, to be fastened to the respective walls 31, 32 and 33 of a triangular drum 34.

A similar spider 35 is connected to the top portion of the triangular drum 34 and it is provided with a hub 36, aligning with the hub of the spider 28 so that the two spiders can be connected by a shaft 37. The shaft 37 extends through the hub 36 and is rotatable in a bearing 38 supported by the channels 10 and 11. Therefore, when power is applied to the worm gear 25, the shaft 24 is rotated in the hub 20 and since the collar 23 is keyed thereto, it will be rotated which, in turn, will impart motion to the spider 28 through the pin or pins 29, causing the triangular drum to be rotated in unison with the gear 25.

The supporting bracket 14 also carries a bearing 39, in which is rotatably mounted a shaft 40, carrying a worm 41 to mesh with the gear 25. In order to insure the proper co-relation between the gear 25 and the worm 41, I prefer to place indicia upon both; for example, a mark or dot 42 may be placed on the face of the gear 25 and a corresponding mating dot or mark 43 may be placed on the worm 41 so that when the two dots are in alignment, it will be apparent that the parts are properly assembled to co-ordinate in the desired manner.

The construction consisting of the sills 12 and 13, the supporting bracket 14 and the parts carried thereby, may all constitute a single unit which may be assembled in the shop preparatory to being shipped to the point at which the sign is to be erected, thus reducing the erection cost to a minimum.

It will be apparent by reference to Figs. 3 and 4 that the shafts 40 have at their respective ends couplings 44 and 45, by means of which connecting shafts 46 may be employed to connect aligning adjacent units to provide a built-up structure, the number of units being determined by the length of the sign and the power to operate them.

In the illustrated embodiment of my invention I have shown four units which I will generically designate A, B, C and D, it being understood that each unit is a counterpart of the other.

I have provided a novel means of imparting motion to the respective sign units and this mechanism is best shown in Fig. 4, in which 47 designates a motor which drives a worm shaft 48, meshing with a worm gear 49 in a manner well understood.

The worm gear is carried by a shaft 50, mounted in the bearings 51 and 52 and rigidly carrying a pinion 53 at one end, which is adapted to mesh with a main driving gear 54, loose on shaft 55 in bearings 56 and 57. On the shaft 55 and adjacent to the drive gear 54 is a clutch disk 58, having notches 59 in the perimeter thereof which are adapted to be engaged by an intermittently functioning clutching and escapement pawl 60, mounted on the shaft 61 rotatable in the rim of the wheel 54 and carrying at its opposite end a crank arm 62, connected to the spoke 63 by a tension spring 64 so that the tendency is for the toe 65 of the pawl 60 to engage in one of the notches 59 of the disk 58 whereby when the gear 54 is rotating in a clockwise direction (according to Figs. 5 and 6), the disk 58 will be rotated with it until the heel portion 66, carrying the roller 67, contacts with the throw-out or release device 68 having an arcuate edge 69 on which the roller 67 rides. For example, as shown in Fig. 5, the disk 58 and the gear 54 are rotating together but as shown in Fig. 6, the roller has come in contact with the arcuate edge 69 of the release plate 68 so that the heel portion becomes effective in swinging the toe portion 65 out of engagement with the notch 59 and in that event, the gear 54 continues to rotate irrespective of any movement of the disk 58 and will continue to do so until the roller 67 has moved away from the edge 69, whereupon the spring 64 will again become effective in throwing the toe portion 65 into engagement with a notch 59 to again clutch the disk 58 to the gear 54 and impart motion thereto.

As designed, it is intended that the gear 54 shall rotate about two-thirds of a revolution independently of the disk 58 and one-third of a revolution with the disk 58 so that the shaft 55 will be rotated about one-third of the time that the gear 54 is rotated.

When the shaft 55 rotates, it imparts motion to a gear 70 which, in turn, rotates a pinion 71 on a shaft 72, mounted in bearings 73 and 74. The shaft 72 carries a pinion 72' which meshes with a pinion 75 on shaft 75' in the bearing 76 and is connected to the shaft 40 of the first sign unit through the medium of the coupling 44. The ratio of the gears is such that the sign unit will be rotated at a slow enough speed that one of its faces or walls 31, 32 or 33 will be visible through the opening 9 for a sufficient length of time to permit the indicia thereon to be adequately observed and since each co-related, mating sign face of a complementary drum on a coupled aligning unit will have the same movement as the first drum, it will be apparent that all of the faces of whatever number of units are employed will be brought together as in Fig. 1 to present a sign of the desired length with the mating faces in unbroken alignment.

The ratio of the gears may be changed to suit existing conditions but an important feature of my invention is the provision of the locking effect provided by the worm 41 and the gear 25 because when the parts are properly synchronized, there can be no overrunning of the drum due to inertia generated therein during the movement of the drums nor can there be any misalignment due to storms or heavy winds because pressure at either end of any one of the faces 31, 32 or 33 of the triangular drum would under no circumstances be enough to rotate the worm 41 through the gear 25. In other words, I have taken advantage of the knowledge that in a worm gear drive motion can only be transmitted from the worm to the gear and not vice versa. This affords an efficient locking means to maintain the elements in proper alignment.

In Fig. 10 I have shown a conventional diagram of a light circuit in which the service line 77 is connected to the motor 47, to the conductors 78 and 79 and to the lamp conductors 80 and 81, there being a switch 82 between the conductors 78 and 79 and 80 and 81. The switch is preferably a knife switch of conventional form and it is adapted to be connected to a rocking lever 83 by a link rod 84, one arm of which is provided with a roller 85 adapted to ride over a rotating, mutilated disk 86 preferably on shaft 55, the mutilated disk being adapted to rock the lever against the action of the spring 87 so that the switch 82 will be intermittently opened and closed to flash the lights 88 on and off alternately during the time that the sign is exposed and changing.

It will be apparent from the foregoing that a sign constructed in accordance with my invention may operate at uniform speed at intermittent periods without liability of overrunning of any of the elements, that the driving connection between the worm 41 and the gear 25 affords an efficient lock for preventing overrunning of the drum members, that the device can be readily assembled in the shop to be set up at the point of destination in a most convenient manner without liability of any of the parts being deranged in the erection, and that the erection may be accomplished without the necessity of any special knowledge of the mechanism involved.

What I claim and desire to secure by Letters-Patent is:

1. A device of the class described, comprising rotatable, indicia-carrying drums having complementary aligning faces and mounted for rotation about fixed axes, mechanism for synchronously rotating the drums to successively present complementary aligning faces, said mechanism comprising connected, independent driving means for each drum, the driving means operating in unison and an intermittently operated driving mechanism for said driving means comprising a drive wheel, a shaft on which the drive wheel is loosely mounted, a notched disk fixed to the shaft, a spring actuated pawl on the drive wheel and normally urged into notch-engaging position and means for temporarily contacting with said pawl to move it out of notch-engaging position during part of the rotation of the drive wheel.

2. In a device of the class described a driving wheel, a shaft on which the driving wheel is loosely mounted, a notched disk fixed to the shaft, a pawl on the driving wheel and normally urged into notch-engaging position, a worm mechanically connected to said shaft, a gear normally driven by the worm, a drum having sign, indicia-carrying faces rotatable by said gear, and means for imparting a continuous rotative movement to the driving wheel.

In testimony whereof I affix my signature.

FRED G. WHITE.