June 12, 1951 G. W. GRAY 2,556,472

SIGN REVOLVING MECHANISM

Filed April 26, 1947 2 Sheets-Sheet 1

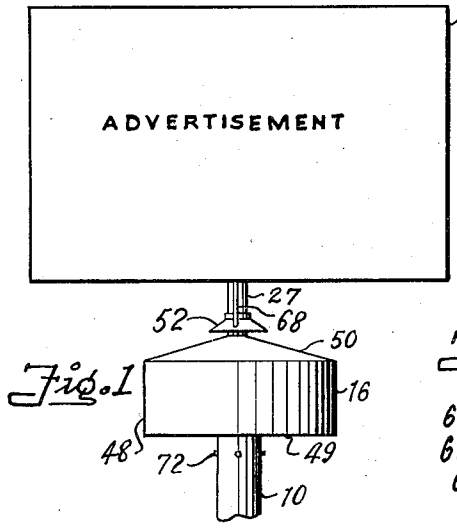


Fig. 1

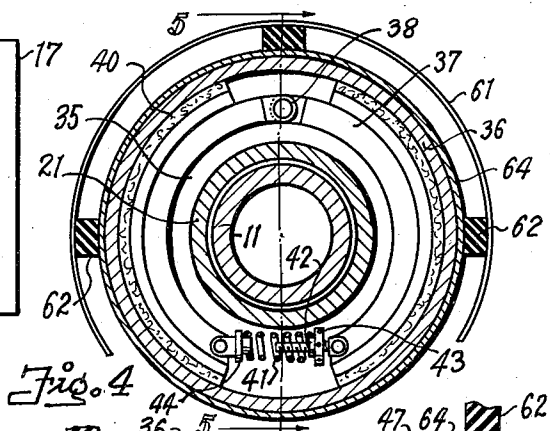


Fig. 4

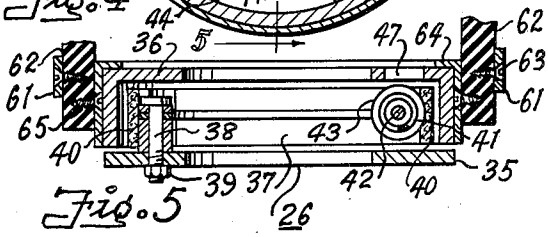


Fig. 5

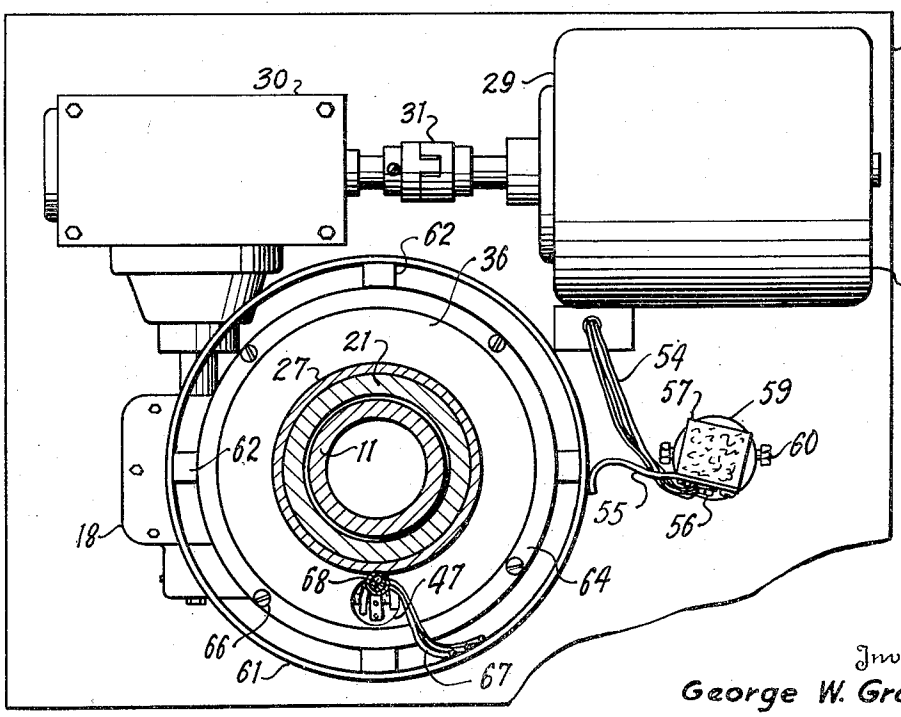


Fig. 3

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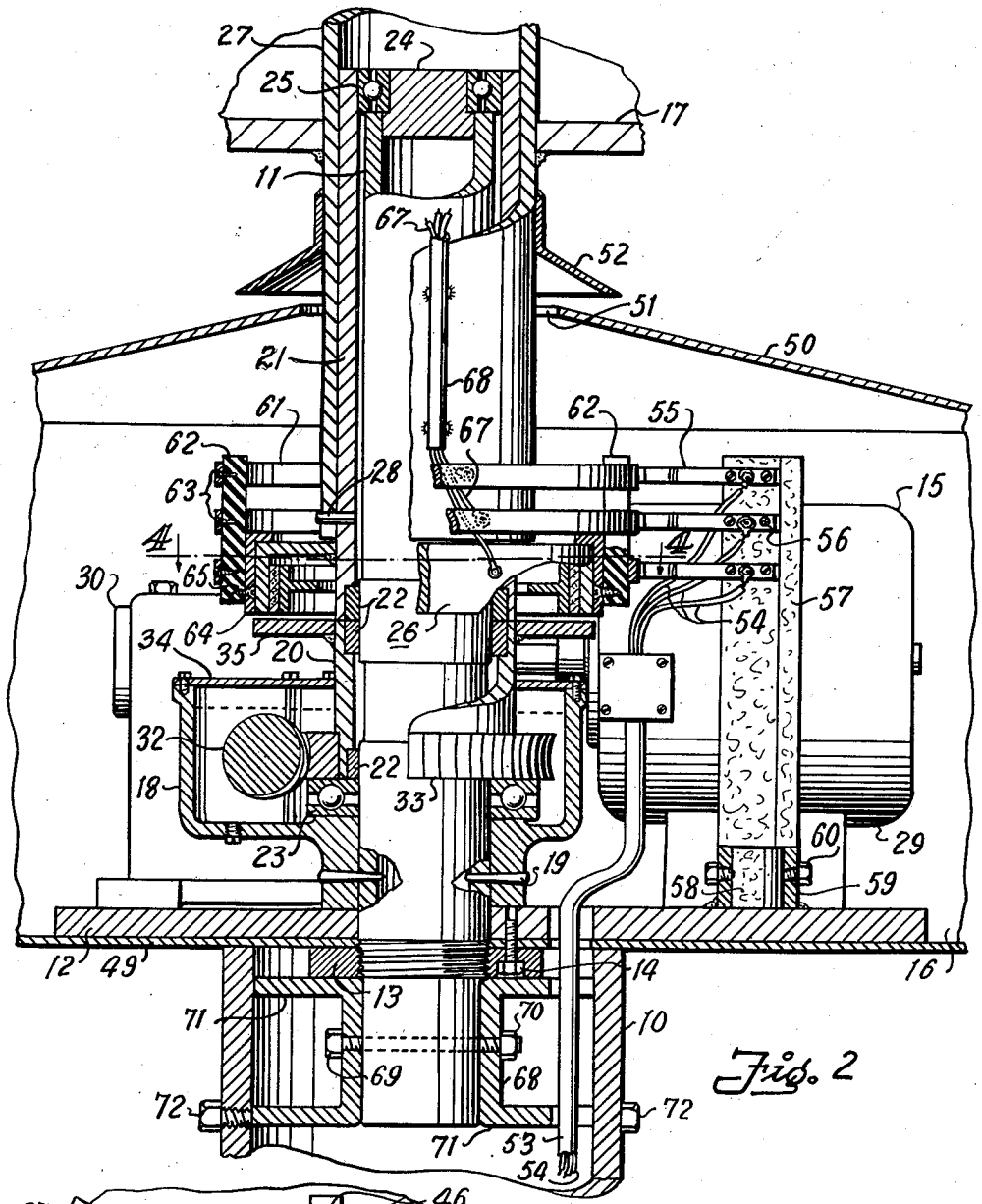


Fig. 2

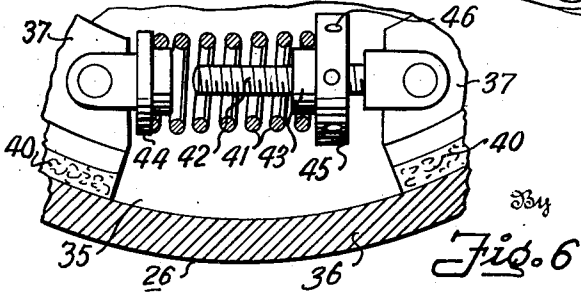


Fig. 6

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SIGN REVOLVING MECHANISM

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2 Claims. (Cl. 40—33)

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This invention relates to new and useful improvements in revolving signs and more particularly to mechanisms for rotating the same.

One object of the invention is to provide an improved sign or display which is adapted to be rotated and which may be illuminated electrically, the sign having a novel mounting and drive connection.

A particular object of the invention is to provide an improved revolving sign having drive means for rotating the same of such construction that a controlled independent or reverse rotation of the sign relative to the drive means is permitted without damaging said drive means.

An important object of the invention is to provide an improved sign revolving mechanism having yieldable drive connection with a sign whereby excessive or heavy loads imposed upon the sign, by strong winds or other exterior forces, are prevented from being transmitted to and damaging the mechanism.

Another object of the invention is to provide an improved sign revolving mechanism, of the character described, wherein the drive connection may be adjusted to a predetermined torque load whereby slippage or relative rotation of the sign is permitted so as to prevent damaging of the mechanism when excessive loads or forces are exerted upon said sign.

A further object of the invention is to provide an improved sign revolving mechanism of rugged, compact construction adapted to be constructed and sold as a unit for use with any suitable display irrespective of whether the latter has been previously constructed.

A construction designed to carry out the invention will be hereinafter described together with other features of the invention.

The invention will be more readily understood from a reading of the following specification and by reference to the accompanying drawing, wherein an example of the invention is shown, and wherein:

Fig. 1 is an elevational view of a sign and revolving mechanism, constructed in accordance with the invention, and mounted upon a support,

Fig. 2 is a transverse, vertical, sectional view of the revolving mechanism and its yieldable drive connection,

Fig. 3 is a plan view of the mechanism, showing its relation to the support and drive connection,

Fig. 4 is a horizontal, cross-sectional view of the drive connection, taken on the line 4—4 of Fig. 2,

Fig. 5 is a transverse, vertical, sectional view, taken on the line 5—5 of Fig. 4, and

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Fig. 6 is detailed view of the adjusting means of the drive connections.

In the drawings, the numeral 10 designates an upright support in the form of a tubular standard or pipe which may be of any desired diameter and length in accordance with the size and location of the display to be mounted upon the standard. As will be hereinafter explained, a tubular shaft or pipe 11 has its lower end engaging within the upper portion of the standard 10, whereby the remainder of the shaft projects axially above said support (Fig. 2). The shaft 11 has a base plate 12 mounted thereon and is externally screw-threaded immediately above the standard to receive a suitable nut or collar 13 which underlies the plate and is fastened thereto by a screw 14. A revolving mechanism or drive means 15 is carried by the plate 12, which rests upon the standard, and is enclosed within a housing 16. The shaft projects upwardly through the plate and the top of the housing 16 and has a sign or display 17, of any desired size and shape, mounted upon its upper end.

A gear case 18 is supported by the base plate 12 and surrounds the shaft 11, being secured thereto by suitable tapered pins 19 so as to be fixed against relative rotation. Above the gear case 18, a pair of co-axial superimposed sleeves or members 20 and 21 are rotatably mounted upon the shaft by means of suitable bearings 22. The lower sleeve 20 is of relatively short length and depends into the gear case so as to rest upon a thrust bearing 23 carried by the shaft. A plug 24 closes the upper end of the shaft and a ball bearing 25 is interposed between the plug and the upper end portion of the sleeve 21. As will be hereinafter described, the sleeves have a yieldable drive connection 26, which has been illustrated in the form of a friction clutch, whereby rotation of the sleeve 20 may be transmitted to the sleeve 21. The sign 17 includes a central supporting sleeve or pipe 27 which has a snug sliding fit upon the sleeve 21 and which extends downwardly into the housing 16 so as to be supported by a portion of the clutch 26. To facilitate removal of the sign, the lower end of the pipe 27 is slotted for receiving one or more radial pins 28 carried by the sleeve 21 whereby said pipe and the sign rotate or revolve with said sleeve.

As shown in Figs. 2 and 3, an electrical motor or prime mover 29 is mounted on the base plate and is connected to a gear reduction unit 30 by a flexible coupling 31. A worm 32 is disposed within the gear case 18 and is adapted to be driven by the gear reduction unit 30. The worm 32 is in

constant mesh with a worm gear 33 which is carried by the lower end of the sleeve 20 and rests upon the thrust bearing 23. Manifestly, the sleeve 20 is driven by the revolving mechanism so as to impart rotation through the clutch 26 to the sleeve 21, pipe 27 and sign 17. The top of the gear case 18 is closed by a suitable cover plate 34 to retain a supply of lubricant within said case.

The clutch 26 includes an annular plate or driven element 35 carried by the lower sleeve 20 and an angular, overlying flange or drum 36 which is suitably secured to the upper sleeve 21. As shown in Figs. 4 and 5, a pair of arcuate friction elements or shoes 37 are pivotally connected to the plate 35 by a suitable bolt 38 and nut 39 so as to be disposed within the drum 36. The shoes 37 are swung on an arc having the same radius of curvature as the drum and have frictional means or pads 40, such as brake lining, secured to their arcuate exteriors for engaging the inner peripheral surface of said drum. For urging the shoes outwardly into engagement with the drum, a coiled spring 41 is disposed diametrically opposite the bolt 38 between the free ends of said shoes and is confined upon an adjusting screw 42 between a nut 43 and a spring retainer 44. As is most clearly shown in Fig. 6, the retainer 44 is riveted or otherwise secured to the free end of one of the shoes, while the screw 42 is similarly attached to the adjacent free end of the other shoe and has the nut 43 threaded thereupon. An enlarged head 45, having radial recesses or openings 46 formed therein, is made integral with the nut 43 to permit adjustment of the same by means of a suitable tool (not shown). Since the spring is confined between the nut and the retainer 44, adjustment of the position of said nut upon the screw varies the compression of said spring as well as the engagement of the friction means 40 with the drum. Access to the nut for adjusting the same is had through a suitable opening 47 formed in the top of the drum 36 (Fig. 5).

The housing 16 is preferably split vertically into a pair of semi-circular segments or sections 48 which are suitably fastened to a circular bottom plate 49. The latter underlies the base plate 12 and is clamped between said plate and the nut 13 (Fig. 1). As shown by the numeral 50, the top of the housing 16 is substantially conical and has an opening 51 at its apex for accommodating the pipe 27 which depends into said housing and rests upon the drum 36 of the clutch 26. A hood 52 is mounted on the pipe immediately above the opening 51 so as to shield the latter and prevent rain and other extraneous matter from entering the housing.

From the foregoing, it is readily apparent that the sign 17 is rotated by the revolving mechanism 15. The motor 29 drives the gear reduction unit 30 which, in turn, rotates the worm 32. Since the worm gear 33 is in constant mesh with the worm, the lower sleeve 20 is rotated relative to the shaft 11 and this rotation is imparted to the upper sleeve 21 by the clutch 26. Due to the provision of the pins 28, the pipe 27 and sign 17 are revolved by the rotation of the sleeve 21. Manifestly, the sign is exposed to torque loads caused by strong winds and other external forces and the effective force of these loads increases with the size of said sign. Frequently, the wind is of sufficient force to halt rotation of the sign, cause reverse rotation thereof or revolve said sign when the revolving mechanism is not operating.

In order to protect the gear reduction unit and other elements of the revolving mechanism from these excessive or heavy loads, the frictional engagement of the shoes 37 with the drum 36 of the clutch is adjusted in accordance with the capacity of said unit and other elements and the area of the sign. Thus, when an exterior force in excess of a predetermined load is imposed upon the sign, the shoes will slip so as to permit relative rotation of the drum, sleeve 21, pipe 27 and said sign. In this manner, damaging of the revolving mechanism, and particularly the gear reduction unit, is prevented. The adjustability of the frictional engagement of the shoes is important because the torque load imposed upon the sign varies in accordance with the size and location of said sign. Manifestly, the sign is adapted to be positioned relatively close to the ground, upon buildings or in locales having strong winds.

In order to illuminate the sign and supply electrical current to the motor 29, a conduit 53 is disposed within the standard 10 and extends upwardly through the housing bottom 49 and base plate 12 to said motor. Suitable lead wires 54 are carried by the conduit 53 and a portion of these wires extend past the motor to a plurality of resilient contact brushes 55, being connected thereto by contact screws 56. The brushes 55 are disposed in horizontal, superimposed relation and are carried by an upright post 57 of suitable insulating material. A cylindrical shank 58 is formed on the lower end of the post 57 for engaging within a supporting collar 59 which is welded, or otherwise secured, to the base plate 12. Set screws 60 are carried by the collar 59 for engaging the shank 58 of the post so as to maintain said post and the brushes in adjusted positions. For conducting electrical current to the sign, a plurality of superimposed contact rings 61 are mounted on the drum 36 of the clutch 26 in horizontal alinement with the brushes. As is clearly shown in Figs. 2 and 5, the contact rings 61 are spaced outwardly and insulated from the clutch drum by vertical insulating bars or blocks 62 which are interposed between said rings and drum. Suitable screws 63 connect the contact ring to the insulating blocks and said blocks are fastened to an annular bracket or flanged ring 64 by similar screws 65. The bracket 64 surrounds the clutch drum and has its inwardly-directed flange overlying and attached to the top of said drum by suitable screws 66. Each contact ring 61 has one end of a lead wire 67 secured thereto and these lead wires extend upwardly through the housing opening 51 and the hood 52 to the sign. If desired, the lead wires 67 may be housed within a conduit 68 which is disposed externally of the sleeve 21.

Although the lower end of the shaft 11 may be supported by the upper end of the standard 10 in suitable manner, it is preferably removably secured therein as shown in Fig. 2. A spool or flanged collar 68 encircles and is fastened to the lower end of the shaft by a suitable bolt 69 and nut 70. The collar 68 has a pair of spaced, radial flanges 71, of a diameter substantially equal to the internal diameter of the standard, for engaging the inner surface of the latter. Suitable set screws 72 are threaded through the wall of the standard for engaging the lowermost flange 71 and preventing movement of the collar and shaft relative to said standard.

From the foregoing, it will be readily apparent that an improved revolving sign of simple, rugged construction has been provided. The revolving mechanism 15, which includes the clutch 26 and

sleeves 20 and 21 may be assembled for use with any type of revolving sign. When it is desired to erect a sign, it is only necessary to insert the lower end of the shaft 11 into the tubular standard or pipe 10 and secure said shaft by means of the set screws 72. The sign 17 is supported upon the shaft by telescoping the pipe 27 upon the sleeve 21 and lowering said pipe through the housing opening 51 until its lower end rests upon the top of the clutch drum 36. As has been explained, the pins 28 prevent relative rotation between the pipe and sleeve. Since the revolving mechanism is disposed within the housing 16 and is carried by and includes the shaft 11, any sign may be mounted upon said shaft by merely providing the same with a central mounting, such as the pipe 27. The revolving mechanism is adapted to be constructed and sold as a unit for use with any suitable sign or display. Manifestly, the sign may be readily removed for repairs, transportation or the substitution of a new sign. It is only necessary to provide the pipe 27 with the hood 52 and the conduit 68 for the lead wires 67 and attach the latter to the contact rings 61. Due to the provision of the yieldable connection between the sleeves 20 and 21, excessive or heavy torque loads imposed upon the sign are prevented from being transmitted to the revolving mechanism and particularly to the gear reduction unit 30. As has been explained, the adjustability of the frictional engagement of the clutch shoes 37 makes it possible to vary the yieldable connection in accordance with the capacity of the revolving mechanism and the size and location of the sign.

The foregoing description of the invention is explanatory thereof and various changes in the size, shape and materials, as well as in the details of the illustrated construction may be made, within the scope of the appended claims, without departing from the spirit of the invention.

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

1. A sign revolving mechanism including, a support, a pair of members rotatably mounted on the support independently of each other, a display carried by one of the members, drive means for revolving the other member, and clutch means connecting said members for transmitting rotation to the member carrying the display and permitting relative rotation of said latter member when an excessive torque load is imposed upon said display and member, the clutch means including coacting friction elements mounted on said members, the frictional engagement of the elements being adjustable in accordance with predetermined torque loads.

2. A sign revolving mechanism including, a support, a pair of members rotatably mounted on the support independently of each other, a display carried by one of the members, drive means for revolving the other member, and clutch means connecting said members for transmitting rotation to the member carrying the display and permitting relative rotation of said latter member when an excessive torque load is imposed upon said display and member, the clutch means including a driven element mounted on one member and adjustable coacting frictional elements mounted on the other member, the frictional engagement of the elements being variable in accordance with predetermined torque loads.

GEORGE W. GRAY.

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