June 20, 1967 F. W. LEUTHESSER 3,325,931

ROTATING SIGN

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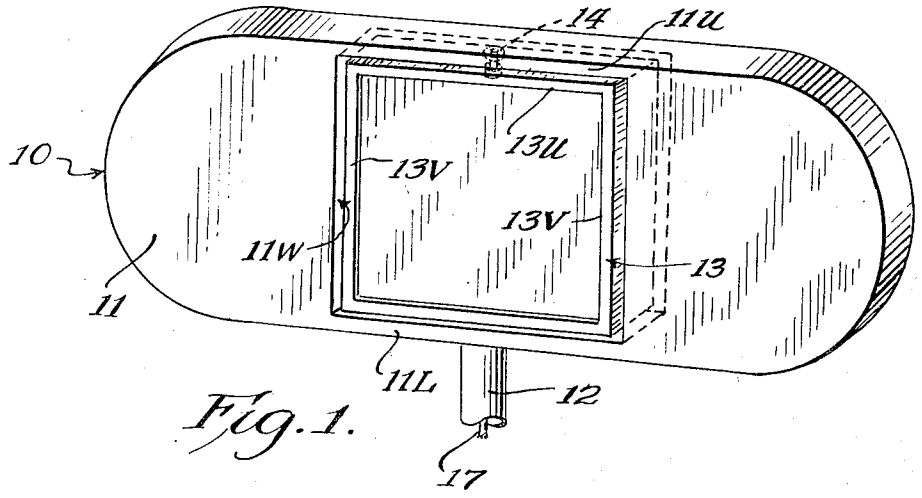


Fig. 1.

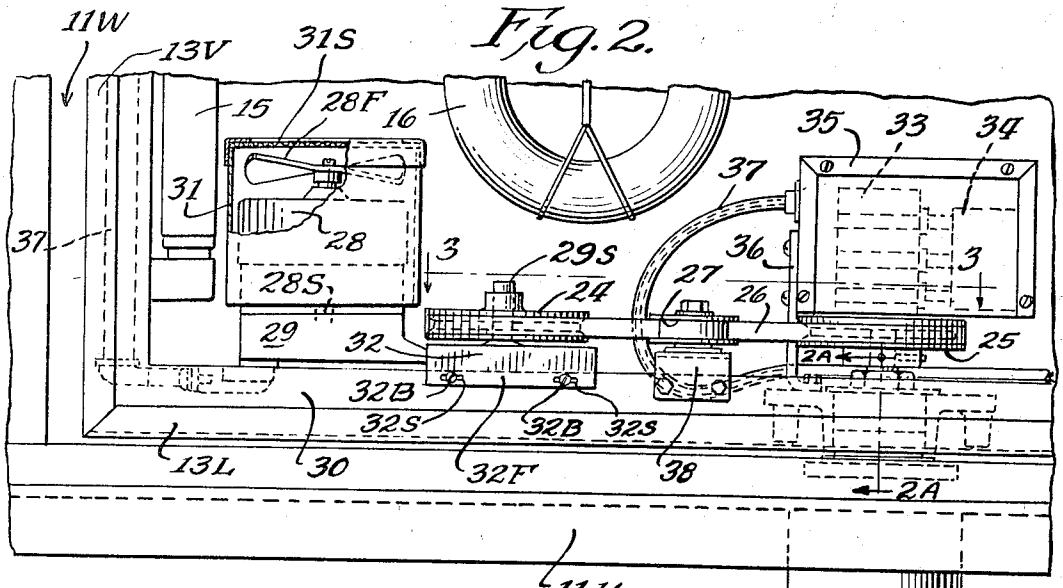


Fig. 2.

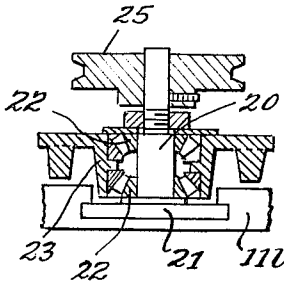


Fig. 2A.

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Fig. 3.

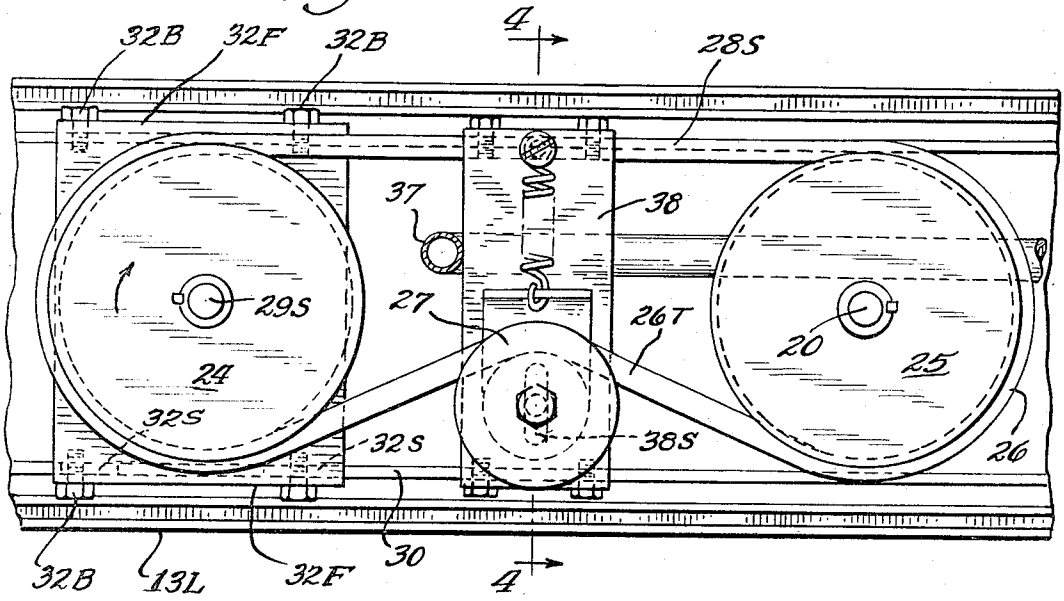
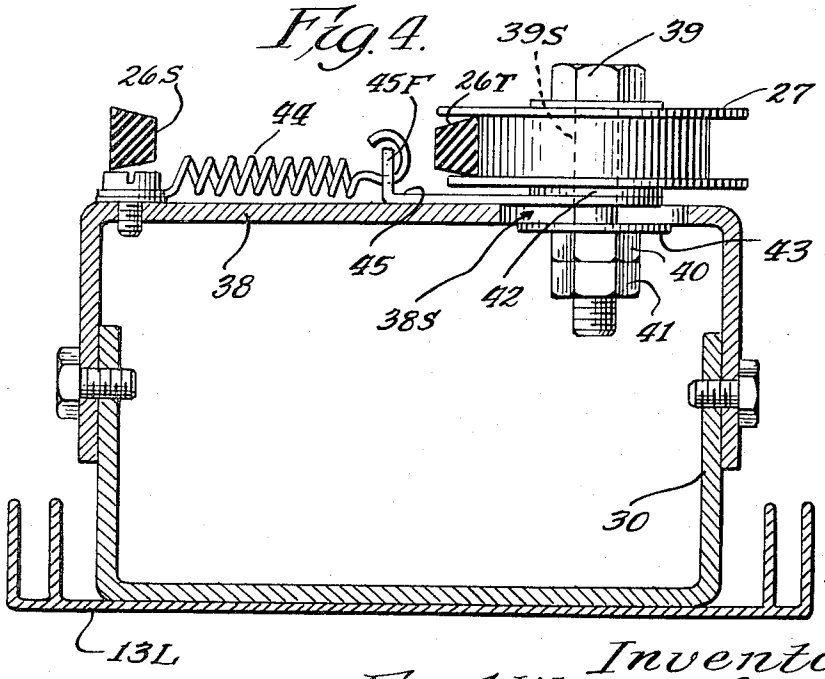


Fig. 4.



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ROTATING SIGN

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3 Claims. (Cl. 40—33)

This invention relates to a rotating sign construction and more particularly is concerned with an internal rotator mechanism for use principally in an outdoor, overhead type illuminated sign, the rotator mechanism being arranged to be located within a revolvable sign frame to move therewith.

The principal object of the invention is to provide a sign rotating mechanism of simplified arrangement and one that is easy to maintain and repair.

Another object of the invention is the provision of a rotator mechanism utilizing a pulley system equipped with a highly sensitive readily adjustable belt tightener arrangement to adapt the normal driving action to the requirements of each particular sign installation.

Still a further object of the invention is the provision of an internal rotator drive structure for a sign of the pulley and belt type and equipped with a friction adjusting spring loaded idler pulley that is yieldable in response to abnormally high belt forces occasioned by blockage of sign rotation to set up a desirable low friction slippage of the belt and relieve the drive.

Other and further objects of the present invention will be apparent from the following description and claims, and are illustrated in the accompanying drawings which show structure embodying preferred features of the present invention and the principles thereof, and what is now considered to be the best mode in which to apply these principles.

In the accompanying drawings forming a part of this specification and in which like numerals are employed to designate like parts throughout the same:

FIG. 1 is a generalized perspective view of a rotating sign embodied as a typical outdoor overhead illuminated type;

FIG. 2 is a fragmentary side elevational view of the rotating sign frame and illustrating a preferred internally mounted rotator mechanism constructed in accordance with this invention;

FIG. 2A is a fragmentary detail view taken on the line 2A—2A of FIG. 2;

FIG. 3 is a plan view taken approximately on the line 3—3 of FIG. 2; and

FIG. 4 is a fragmentary sectional view of an adjustable idler pulley arrangement utilized in accordance with this invention and is taken on the line 4—4 of FIG. 3.

Referring now to the drawings and particularly to FIG. 1 thereof, a sign 10 is illustrated here for purposes of disclosure as being of an outdoor overhead illuminated type and it includes a stationary base frame 11 carried at the top of a tubular mast 12 and a revolvable sign 13 located within a central window 11W defined by the base frame 11 and supported in rotatable relation upon the base frame 11. The base frame 11, as illustrated herein, has the configuration of a sign to serve in conjunction with the rotatable sign 13 but it will be apparent that the rotatable sign 13 may be mounted as the sole element at the top of the mast 12 or may be mounted in various other arrangements familiar to those skilled in this art.

In the preferred constructional embodiment shown herein for purposes of illustrative disclosure the base frame 11 has upper and lower horizontal rails 11U and 11L, respectively, bordering and partially defining the mounting window 11W for the rotating sign 13. In this particular construction, the rotating sign has a generally

rectangular frame having upper and lower frame rails 13U and 13L, respectively, and a pair of vertical rails 13V suitably interlocked to form a rigid framework. For larger size rotating frames, a bearing 14 may be employed between the upper rails 11U and 13U of the base frame and rotating frame to stabilize the rotatable mounting.

As is apparent in FIG. 2, fluorescent lamps 15 and 16 of various configurations are housed within the rotating sign 13 to be energized from a supply cable 17 that extends upwardly through the mast 12.

In the arrangement disclosed herein the upper end of the mast 12 terminates in the lower rail 11U of the base frame which is also configured to receive and support a stationary shaft 20 (see FIG. 2A) that is aligned with the upper bearing 14 and defines the axis of rotation for the rotating sign. The lower end of the shaft 20 is rigidly affixed to and supported on a base plate 21 nested within the lower rail 11L of the base frame and the shaft projects in journalled relation through bearing elements 22 that are contained within a bearing housing 23 that is rigidly fixed to the lower rail 13L of the rotating sign 13.

The rotator mechanism is contained entirely within the rotating sign 13 and includes coplanar driven and slave pullies 24 and 25, respectively, engaged by a belt loop 26 and adjustably engaged under the control of a friction idler pulley 27. A drive motor 28 for powering the sign 13 is shown alongside the drive pulley and it is connected through a horizontally elongated gear box 29 to rotate the drive pulley 24 at a greatly reduced speed. The gear box 29 is nested within a U-shaped re-enforcing channel 30 that is mounted on the lower rail 13L of the rotating sign to serve as a common horizontal support structure for mounting the parts of the rotator mechanism that are to be carried by the rotating sign frame.

Since the motor 28 is located within a chamber that is completely enclosed by the sign 13, it is self-sealed and for proper cooling, it is equipped with a hood 31 having a screen 31S across its upper end to provide for flow of air induced by a fan blade 28F mounted at the upper end of the motor shaft 28S. In FIG. 2, the motor shaft 28S is shown entering the left-hand end of the horizontally elongated gear box 29 while the right-hand end of the gear box 29 has an output shaft 29S drivingly connected to the drive pulley 24 which is supported upon a channel-shaped cross brace 32 (see FIG. 3) that has side flanges 32F equipped with mounting bolts 32B that are engaged in horizontally elongated slots 32S to permit varying the position of the drive pulley 24 thus facilitating installation and removal of the belt loop 26, the drive pulley 24, the motor 28 or the gear box 29 where desired.

The slave pulley 25 is mounted fast upon the shaft 20 and a multiple ring commutator cylinder 33 is located above and aligned with the slave pulley 25 and is also stationary. A multiple brush unit 34 is mounted within a cover element 35 for the commutator 33. The cover 35 is carried at the upper end of a mounting bracket 36 that is secured to the bearing housing 23 to rotate with the sign 13 and cause the brush unit 34 and housing 35 also to rotate with the sign 13.

The wires 17 lead through the lower rail 13L, the stationary shaft 20 which is tubular, and connect to the commutator 33 in the usual fashion. Electrical connection wires tapped from the brush unit 34 are carried in a conduit 37 which exists from the housing 35 and passes downwardly through the center of the belt loop 26 and then extends along beneath the belt unit to lead to appropriate energizing sockets for the fluorescent lamps 15 and 16 and for the motor. There is particular advantage in this arrangement in that the belt loop 26 is not interlocked with the cable loop thus making possible removal of the belt loop merely by release of the mounting bolts 32B

for the support bracket **32**. The belt is called upon in the disclosed arrangement to function as a slip-friction element in the event the rotating sign becomes obstructed and the possible wear to which the belt is exposed makes it desirable that belt replacement be as simple as possible.

Finally, the idler pulley **27** is arranged upon a support bracket **38** which spans the main horizontal support channel **30** as shown in FIG. 4. The support bracket **38** has a slot **38S** oriented crosswise of the belt loop **26** and the idler pulley **27** is rotatable about the shank **39S** of a bolt **39** that extends in guided relation through this slot **38S**. The bolt shank **39S** is equipped with a pair of nuts **40** and **41** to permit fixed adjustment of the pressure so that slideable movement of the idler pulley **27** may be accommodated without sacrificing a stable mounting therefor. The bolt **39** extends through a pair of washers **42** and **43** to facilitate slideable and rotatable mounting of the idler pulley **27** from its support bracket **38**.

A tension spring **44** has one end anchored to a screw at the far side of the support bracket **38** and has its other end hooked to the upstanding flange **45F** on a slide plate **45**, normally to yieldably bias the idler pulley **27** into belt tightening engagement with the tensioned reach **26T** of the belt which is upstream and hence approaching the drive pulley **24**. The slack reach **26S** of the belt loop is normally free of substantial belt loads.

The action of the idler pulley in relation to the tensioned reach **26T** of the belt accommodates a broad range of adjustment and permits a sensitive adjustment of the drive action of the rotator mechanism. Moreover, in the event of blockage of sign rotation the idler pulley **27** may easily yield in response to the abnormally high belt forces which will cause elongation of the tension spring **44** and permit the tensioned reach **26T** of the belt to straighten out from its formerly distortingly elongated configuration. The straightening of the tensioned reach of the belt results in the development of low friction slippage of the belt relative to the drive pulley **24** so that the sign rotating forces are markedly reduced. This saves the equipment against the hazards of burn-out due to blockage of the sign.

Thus, while preferred constructional features of the invention are embodied in the structure illustrated herein, it is to be understood that changes and variations may be made by those skilled in the art without departing from the spirit and scope of the appended claims.

What is claimed is:

1. Rotator mechanism for a revolvable sign frame and including a slave pulley fast on a stationary shaft that projects into said sign frame, a U-shaped supporting structure within said sign frame having opposed elongated slots therein, a drive pulley coplanar with said slave pulley and journalled on said sign frame to rotate about an axis parallel to said shaft, said drive pulley being mounted on a bracket means adapted to be adjustably secured to said U-shaped supporting structure through said opposed elongated slots, a belt engaged about said pulleys, a motor supported on said sign frame and connected to rotate said drive pulley, thereby to rotate said sign frame about said slave pulley, with said belt having one reach thereof under tension and the other reach thereof free during such rotation of the sign frame, a friction idler pulley coplanar with said slave and drive pulleys and movably mounted on said U-shaped supporting structure for engagement with said one reach of the belt, and resilient means biasing said idler pulley into engagement with said belt in a direction normally to distortingly elongate said one reach and maintain rotating drive of said sign, said resilient means being yieldable in response to abnormally high belt forces occasioned by blockage of rotation of said sign to allow straightening of said one reach and consequent low friction slippage of said belt relative to said drive pulley.

2. In a sign having a stationary support shaft and a sign frame rotatably mounted thereon, rotator mechanism mounted within said sign frame and including a slave pulley fast on said support shaft, a U-shaped supporting structure within said sign frame having opposed elongated slots therein, a drive pulley journalled on said sign frame to rotate about an axis parallel to said shaft, said drive pulley being mounted on a bracket means adapted to be adjustably secured to said U-shaped supporting structure through said opposed elongated slots, a motor mounted on said sign frame alongside said drive pulley and drivingly connected to said drive pulley from underneath thereof, a friction idler pulley coplanar with said slave and drive pulleys and movably mounted on said U-shaped supporting structure, a belt engaged about said pulleys to drive said sign frame upon rotation of said drive pulley, spring means biasing said idler pulley into engagement with said belt in a direction to maintain rotating drive of said sign, said spring means being yieldable in response to abnormally high belt forces occasioned by blockage of rotation of said sign to allow low friction slippage of said belt relative to said drive pulley, a multiple-ring commutator mounted stationary with said shaft along the axis thereof, a multiple-brush unit in electrically connecting cooperation with said commutator and mounted in fixed relation to said sign frame to rotate in unison therewith, power supply wires extending through said shaft and adapted to energize said commutator, and internal wires connected to said brush unit and leading vertically through said belt and adapted to energize said motor.

3. In a sign having a stationary support shaft and a sign frame rotatably mounted thereon, said sign frame having a U-shaped horizontal support structure having an intermediate opening through which said shaft projects, rotator mechanism for mounting internally of said sign frame and comprising a slave pulley fast on said shaft, a shallow gear box mounted on said U-shaped support structure in spaced relation to said slave pulley, a drive motor drivingly connected to said gear box adjacent one end thereof, a first bracket spanning said U-shaped support structure and being removably and adjustably mounted thereto and having a drive pulley coplanar with said slave pulley mounted in driven relation to said gear box above the other end thereof, a belt loop engaged about said pulleys to effect rotation of said sign frame in response to rotation of said drive pulley, with one loop of said belt being under tension and the other loop being free during such rotation, a second bracket spanning said U-shaped support structure crosswise of said belt loop, a friction idler pulley mounted for movement relative to said bracket in a direction crosswise of said belt loop and in the plane thereof, and resilient means normally biasing said idler pulley into belt tightening engagement with said one reach of the belt and yieldable in response to abnormally high belt forces occasioned by blockage of rotation of said sign to allow straightening of said one reach.

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