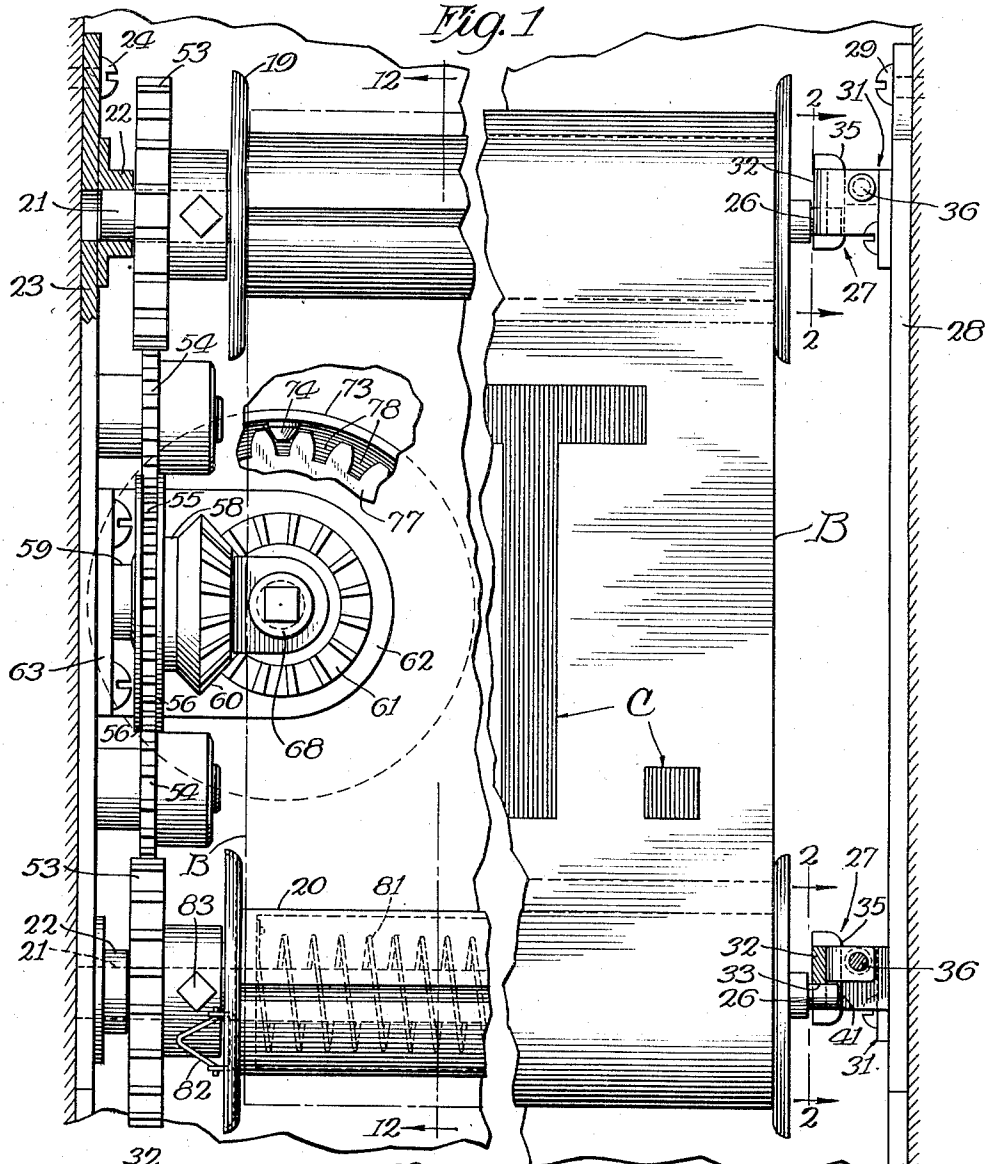
Oct. 31, 1939. W. G. HARTWIG 2,177,715

ROLLER SIGN MECHANISM

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Fig. 1



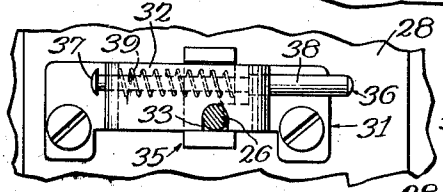


Fig. 2

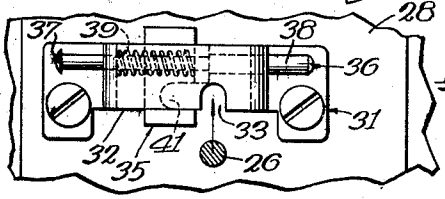


Fig. 3

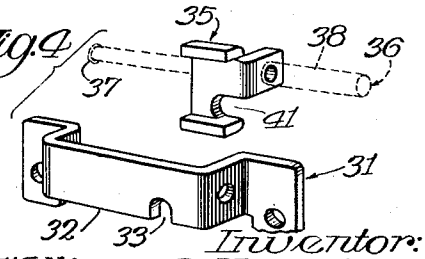


Fig. 4

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ROLLER SIGN MECHANISM

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Fig. 19

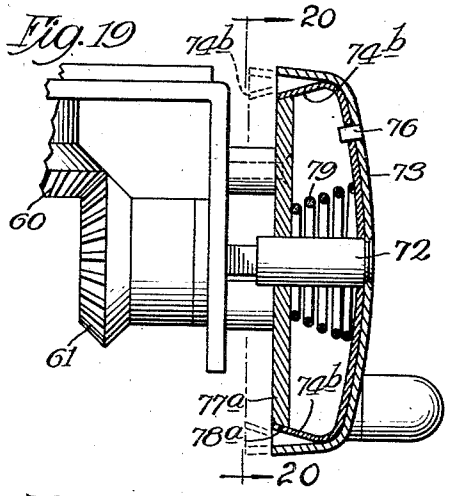


Fig. 20

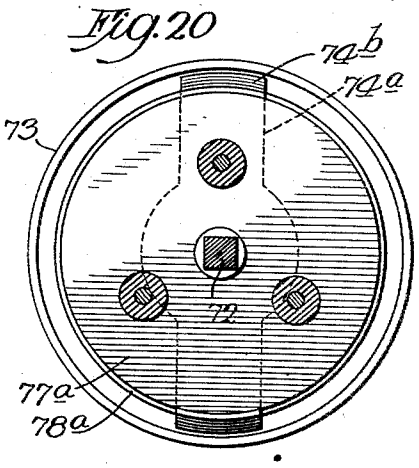


Fig. 17

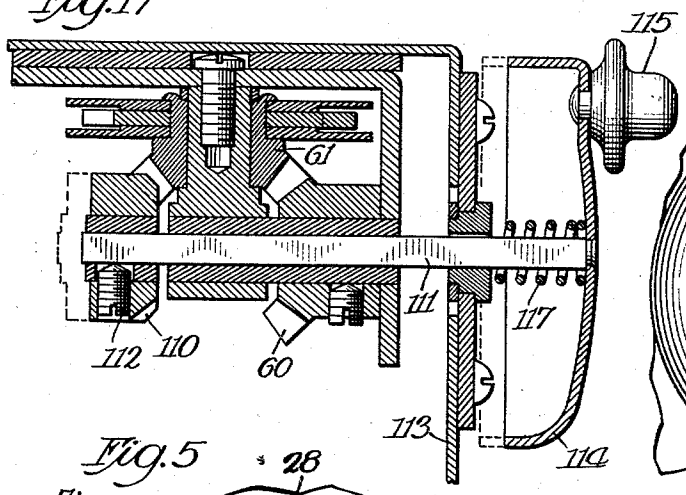


Fig. 18

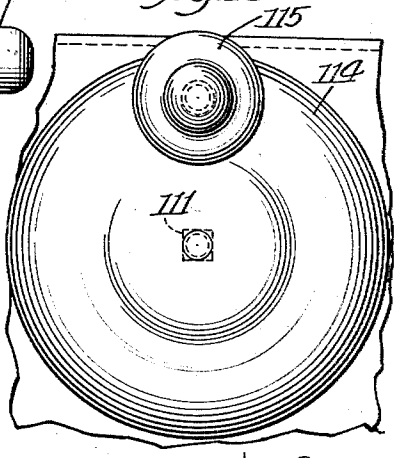
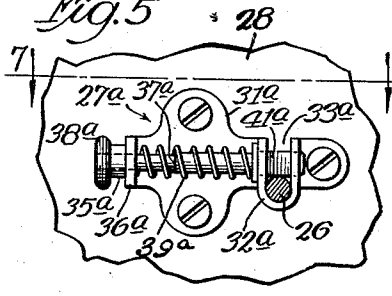


Fig. 5



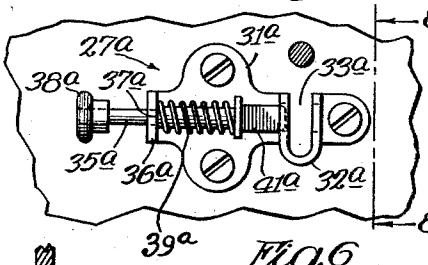


Fig. 6

Fig. 7

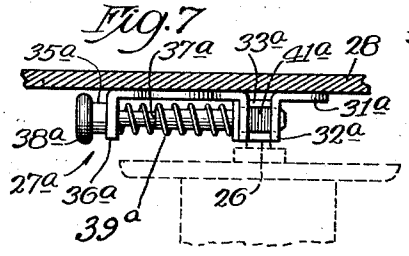
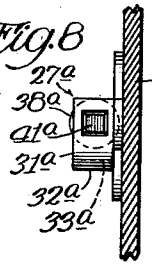


Fig. 8



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ROLLER SIGN MECHANISM

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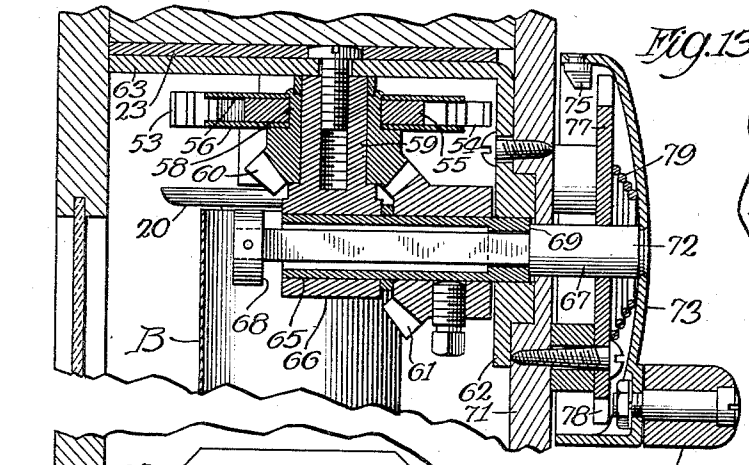


Fig. 13

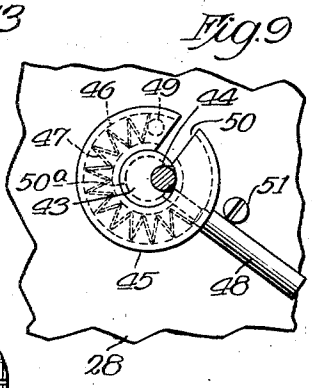


Fig. 9

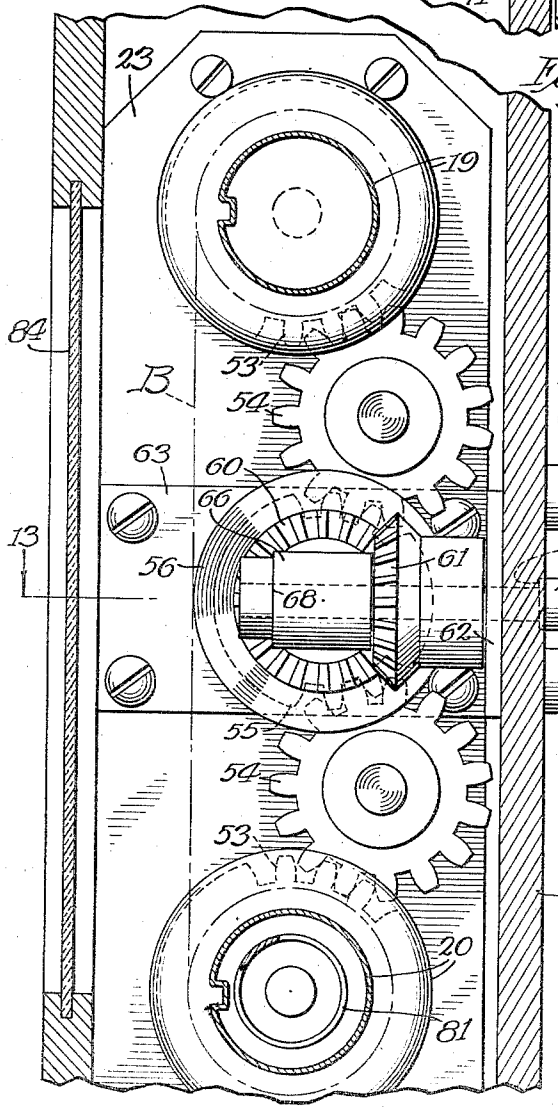


Fig. 12

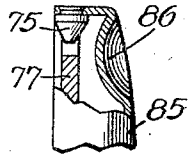


Fig. 14

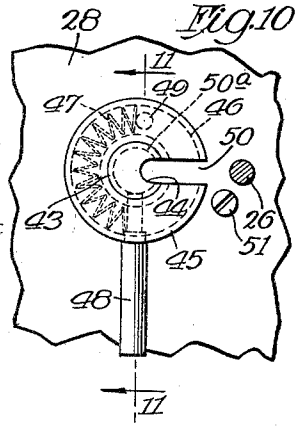
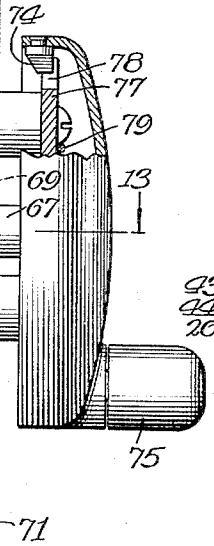


Fig. 10



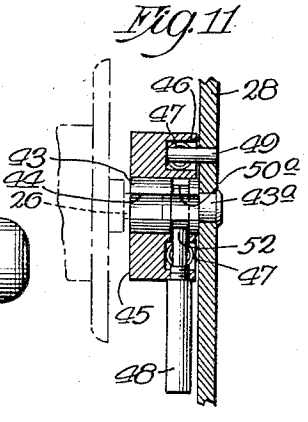


Fig. 11

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ROLLER SIGN MECHANISM

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Fig. 15

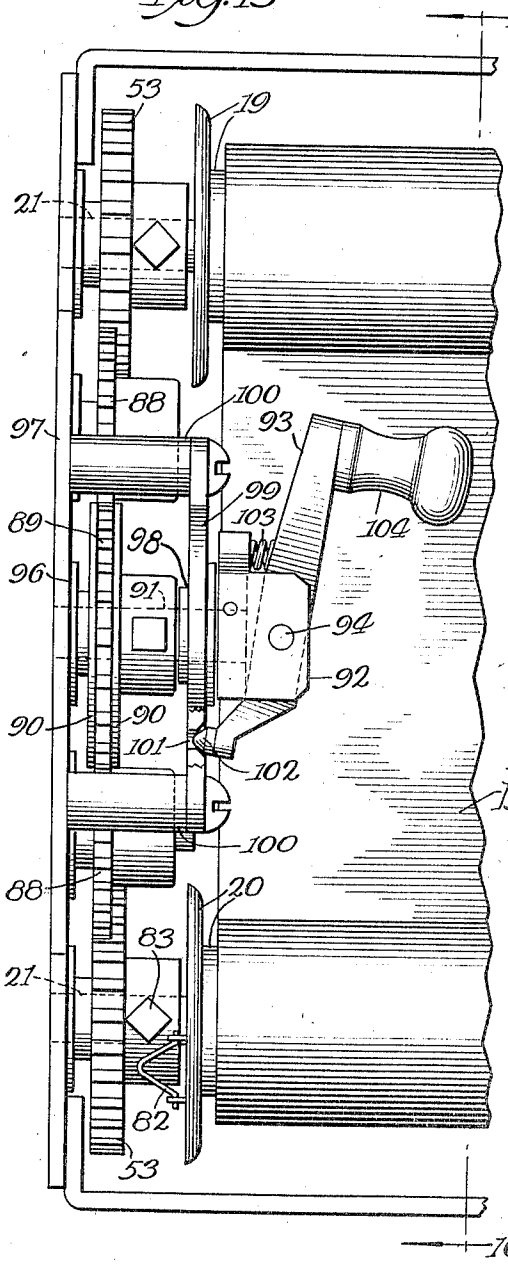
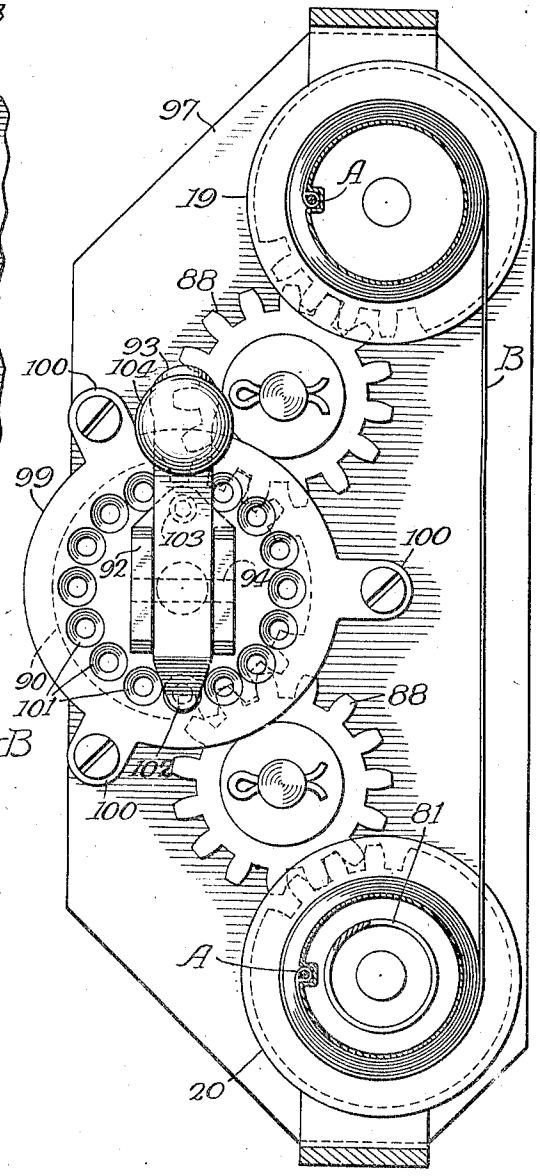


Fig. 16



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Patented Oct. 31, 1939 2,177,715

UNITED STATES PATENT OFFICE

2,177,715

ROLLER SIGN MECHANISM

William G. Hartwig, Chicago, Ill., assignor to Railway Utility Company, Chicago, Ill., a corporation of Illinois

Application June 21, 1937, Serial No. 149,328

21 Claims. (Cl. 40—95)

This invention relates to signs such as may be found on street cars, trains and buses, and is concerned more particularly with those of the variable type operable to selectively display different sign characters.

An object of my invention is to render more facile the manipulation of a variable sign.

Another object is to provide an improved control for a variable sign.

A further object is to provide improved bearing means for releasably supporting a roller of a roller type web sign.

It is another object of the invention to provide an improved bearing structure.

Other objects and advantages of the invention will appear as the description proceeds.

The invention is illustrated in the accompanying drawings, in which—

Fig. 1 is a broken front elevation of the drive and associated mechanism built in accordance with one form of my invention, with portions sectioned.

Fig. 2 is a section of the releasable bearing structure of Fig. 1, taken as indicated by the line 2—2 in Fig. 1.

Fig. 3 is a view similar to Fig. 2 but shows the parts in their relative positions prior to assembly of the bearing with the roller trunnion to be journaled therein.

Fig. 4 shows separated and in perspective the elements providing the bearing surfaces of the bearing structure of Figs. 2 and 3.

Figs. 5 and 6 are views corresponding to Figs. 2 and 3, but of another form of releasable bearing embodying my invention.

Fig. 7 is a section taken as indicated by the line 7—7 in Fig. 5.

Fig. 8 is a section taken as indicated by the line 8—8 in Fig. 6.

Figs. 9 and 10 are views corresponding to Figs. 2 and 3, but of still another form of releasable bearing embodying my invention.

Fig. 11 is a section taken as indicated by the line 11—11 in Fig. 10.

Fig. 12 is a section taken as indicated by the line 12—12 in Fig. 1.

Fig. 13 is a section taken as indicated by the line 13—13 in Fig. 12, but with the handle released, as will appear.

Fig. 14 is a fragmentary section-elevation of a modified handle construction.

Fig. 15 is a fragmentary rear elevation of another drive and control mechanism embodying my invention.

Fig. 16 is a section taken as indicated by the line 16—16 in Fig. 15.

Fig. 17 is a view similar to Fig. 13 but of another form of the invention.

Fig. 18 is a fragmentary front elevation of the same.

Fig. 19 is a sectional view showing a further modified handle construction.

Fig. 20 is a sectional view taken as indicated by the line 20—20 in Fig. 19.

In accordance with the illustrated embodiments of my invention, the sign is of the roller type comprising in general a pair of spaced rollers or spools 19 and 20 to which the ends A of a ribbon or web B are secured. Suitable sign characters C are formed or mounted on the web and the latter is wound about the spools and operated in such manner that either pays out while the other accumulates, so as to selectively display between the spools any of a plurality of informative legends.

Each spool or roller has at one end a shaft extension or trunnion 21 journaled in a bearing 22 carried by an end wall plate 23 adapted to be secured as at 24 to a supporting wall. The other shaft end of each roller is also in the form of a trunnion 26 which may be releasably journaled in a bearing 27 carried by another end wall plate 28 secured as at 29 to a supporting wall.

The bearing 27 chosen for illustrative purposes comprises a U-shaped bracket 31 mounted at its ends on the wall plate 28 and having its intermediate portion 32 projecting toward the roller. The portion 32 has a notch 33 of a size to receive and journal the roller trunnion 26. A latch 35 is slidably carried by the portion 32 by means of a plunger 36 passing through the latch. The plunger has its ends passing through the bracket, one end 37 being headed to prevent its retraction and the other end 38 being held in shouldered engagement with the latch by a spring 39. The latch has a bearing notch 41 arranged to receive the portion of the trunnion 26 adapted to project endwise beyond the notch 33. When the manipulating end 38 of the plunger is pushed, the latch is moved out from under the trunnion 26 to allow the trunnion to be freed of the bearing.

A modified bearing for the trunnion 26 is shown at 27a in Figs. 5 to 8. It includes a bracket 31a mounted on the wall plate 28 and having a U-shaped portion 32a providing a notch 33a of a size to receive and journal the trunnion 26. A latch 35a is carried by the bracket and

has sliding movement limited by engagement of the bracket ear 36a with the shoulder 37a and drawer pull 38a of the latch. The latch is held by the spring 39a in bridging relation to the U-shaped portion 32a so as to prevent accidental removal of the trunnion 26. The bridging portion 41a of the latch may be square as shown, round or of any other suitable shape.

A further modified bearing for the trunnion 26 is shown in Figs. 9, 10 and 11. It comprises a pin 43 secured to the wall plate 28 by a reduced extension 43a and having a U-groove 44 of a length to accommodate the trunnion, the latter being insertable and removable by cross-axial movement in each case. A latch collar 45 is rotatably mounted on the pin 43 and has an arcuate recess 46 in which a spring 47 is compressed between a handle 48 removably mounted on the collar and a stop 49 mounted on the wall plate. The collar is adapted to be moved against the spring pressure to bring its slot 50 into register with the groove 44, to allow the trunnion to be inserted into and removed from the groove. When the handle is released, the collar is held by the spring in the position shown in Fig. 9, the handle abutting another stop 51 removably mounted on the wall plate. The walls of the groove and slot provide adequate bearing area for the trunnion 26.

The mechanism just described is adapted to be disassembled to enable the spring or any other part to be replaced. To this end the pin 43 has an annular groove 50a which communicates with the slot 50. The inner end 52 of the handle 48 projects into this groove. While the mechanism is operatively assembled, the handle end 52 is retained in the groove 50a. When the collar is to be removed, the stud 51 is withdrawn, allowing the collar to turn until the handle end 52 is free of the groove 50a and extends into the slot 50. Now the collar may be drawn axially free of the pin 43, enabling the spring to be replaced. By reverse manipulation the repaired collar may be replaced.

As is apparent, the various bearings readily lend themselves to lubrication.

Each trunnion 21 has fixed thereto a gear which appears at 53 and meshes with an idle gear 54, the gears 54 meshing with the same operating gear 55 between guide plates 56. The gear 55 is carried by a hub 58 rotatable about an arbor 59. Also on the hub 58 is a bevel gear 60 which meshes with a driving bevel gear 61 rotatably mounted on an arm 62 of an angular bracket whose other arm 63 is secured to the wall plate 23 and carries the arbor 59.

The driving bevel gear 61 is fixedly or otherwise mounted to rotate with a bushing 65 journaled in an extension 66 of the arbor 59 and in the bracket arm 62. The bushing 65 is mounted to rotate with a drive spindle 67 which is capable of axial movement relative to the bushing to the extent permitted by the abutments 68 and 69 on the spindle adjacent the ends of the bushing.

A plate 71 extending transverse to the wall plates 23 and 28 provides a rear cover for the sign structure heretofore described. The plate 71 is secured to the bracket arm 62 and has an opening through which the spindle 67 projects. The rear end 72 of the spindle projects to and is secured to rotate with a handle 73 having a detent or dog 74 and a preferably rotatable operating crank or knob 75. Secured about the spindle end 72 is a stationary notched member or locking gear 77 whose notches 78 are adapted selectively to receive the dog 74. A spring 79 yieldably opposes removal of the dog from the notches and, when the dog is disposed in a notch, the dog is yieldably held therein by the spring to prevent accidental turning of the handle. The handle may be pushed by overcoming the spring resistance until the dog is free of the notched member, as in Fig. 13, and while the handle is so thrust it may be rotated in either direction to the extent desired, thereby also moving the sign web. When the handle is interlocked with the notched member, the abutment 68 is engaged as shown in Fig. 12 to prevent the spring from moving the handle beyond the notched member.

The web is moved by causing either end to be wound on one roller and the other end off the other roller. One of the rollers, such as that indicated at 19, is mounted to rotate with the gear 53 by which it is driven. The other roller 20 is connected with the associated gear 53 through a spring 81 so that there may be relative movement and so that slack in the web will be taken up. This relative movement is necessary because of the differential movement which must take place between the rollers when the web is coiled in unequal amounts or diameters about the rollers. A detent 82 on the roller 20 is engageable with a projection such as the gear-securing screw 83 to limit relative movement.

The legend to be displayed may be viewed directly or through means such as a window 84 disposed in a suitable frame in the place where the sign is installed.

When the handle is locked with the notched member and it it desired to move the web to display a different legend, the crank 75 is grasped and pressure applied to it and/or the outer face of the handle 73 until the dog is free of the associated notch 78. The handle is then turned and, through the gearing described, the web is moved. From identifying indicia or simply by sighting the back of the web, or as may be otherwise suitably provided, the operator may ascertain at a glance when he should stop turning the handle. A suitable opening (not shown) at the rear of the web may be provided for this purpose. The handle may come to rest with the detent held engaged with the notched member between successive notches. In such event a slight turning of the handle in either direction will bring the detent in alinement with a notch and, when this is done and the hand pressure on the handle withdrawn, the spring 79 will snap the detent 74 into the notch and thus prevent movement of the legend being displayed.

Instead of providing the handle with a crank, the handle may be of any other character such as that shown in Fig. 14, where the handle 73 has a depressed portion 86 adapted to receive a finger of the hand. The finger is pushed to overcome the spring pressure and release the handle dog 74 and then, while the push is maintained, the finger, by virtue of its engagement with the side wall of the depression, is enabled to impart a turning movement to the handle.

Irrespective of the position of the handle relative to the locking member 77, the latter is always covered by the handle. Thus not only does the handle have a trim appearance but in addition the fingers and sleeve of the operator are protected against being pinched between the handle and the locking member.

A modified operating mechanism appears in Figs. 15 and 16. Here the bevel gearing is dispensed with and the entire mechanism is disposed

in a smaller compass. To this end, the roller gears 53 are meshed with idlers 88 which in turn mesh with the drive gear 89 between face plates 90. The gear 89 is rotatable with a spindle 91 having an extension adapted to rotate with a stirrup 92 on which an actuating handle 93 is pivoted at 94. The spindle may be journaled in a bearing 96 secured to a wall plate 97 and in a bearing 98 carried by a plate 99 mounted as by the posts 100 on the plate 97. The plate 99 has a circular series of recesses or holes 101 adapted selectively to receive a dog 102 carried by the handle 93. The dog is urged toward the plate 97 by a spring 103. When the dog is disposed in a recess 101, the handle is held from being turned accidentally. Rotation of the handle is effected after the crank 104 is pushed until the dog is free, by turning the crank, causing the gearing to operate in a manner readily comprehended to turn the rollers in one direction or the other, as the case may be, and thereby shift the web.

In the forms first described, the axis of rotation of the handle is substantially normal to the displayed part of the web. In Figs. 15 and 16 the axis of rotation of the handle 93 is substantially parallel with the displayed part of the web, and the space between the rollers is utilized to receive the hand of the operator and part of the handle during the operation of the mechanism.

In the form of the invention appearing in Figs. 17 and 18, the collar 68 of Fig. 13 is replaced by a bevel or miter gear 110 held on the angular or other spindle 111 by any suitable means, as a set screw 112. The spindle extends outward through the casing 113 and is secured at its outer terminal to the dished or other handle 114, provided with turning means such as the knob 115. A spring 117 which may be under compression between the handle and the casing constantly urges the handle and with it the spindle and gear 110 in a direction to mesh said gear with the gear 60. Since the gear 60 is always meshed with the gear 61, it follows that when the gear 60 is also meshed with the gear 110 all of these gears are locked and hence no rotation of the handle can occur. By pushing the handle 114 against the spring 117 until the gear 110 is free of the gear 60, as shown in dotted lines in Fig. 17, the handle may be rotated in either direction to adjust the sign.

Since the gears are designed to intermesh, they of course have the same circular pitch. Accordingly, for each movement of the handle through one-half the circular pitch of the gear 61, each of the gears 60 and 110 will be moved oppositely to the other through one-half the circular pitch, so that the relative movement between the gears 60 and 110 is equal to the circular pitch. This movement places the gears 60 and 110 in positions for intermeshing when the handle is released. It is thus evident that in one revolution of the handle it may be locked in a number of positions equal to twice the number of teeth on either of the gears 61 and 110.

In the form of the invention appearing in Figs. 19 and 20, frictional rather than positive retaining means are provided. To this end, the handle 73 carries a strip 74*a* through which the spindle end 72 passes, the strip being held against turning relative to the handle by a pin 76 mounted on either member but preferably on the handle. Disposed about the spindle end is a stationary plate 77*a* having a frusto-conical seat 78*a* frictionally engageable by the inclined ends 74*b* of the strip. This engagement is yieldably maintained by the spring 79 between the strip and the plate, the pressure of the spring being such as to firmly restrain the handle from undesired turning. The handle might be turned while this restraining influence is present, but only with difficulty. This difficulty may be readily removed simply by pushing the handle forward against the action of the spring until the strip is free of the plate seat 78*a*, when the crank 75 may be grasped and the handle easily rotated. When the handle is released, the spring will act automatically to hold the handle in the desired position of adjustment, and it will be observed that the number of adjustments possible is infinite.

When it is desired to remove the web in accordance with any of the forms of my invention, this may be accomplished irrespective of the type of manipulating mechanism employed by simply releasing the roller trunnions 26 from the releasable bearings, swinging the rollers transversely free of such bearings and then withdrawing the other trunnions 21 of the rollers from their respective bearings. The latter bearings afford sufficient clearance to permit this movement without injury to the bearings or to the cooperating trunnions 21, while providing ample bearing surface. The rollers and web may be installed simply by reversing this process.

I am aware that reversals of parts may be resorted to and that numerous details of construction may be varied through a wide range without departing from the principles of this invention. I therefore do not purpose limiting the patent granted hereon otherwise than as necessitated by the prior art.

I claim:

1. A sign comprising a movable part having sign characters, rotary drive mechanism connected with said part for moving said part to display different characters, a rotary actuating spindle axially shiftable and drivably connected to said mechanism, a rotary dished handle drivably connected to said spindle, stationary engaging means in said handle and between said handle and said mechanism, cooperative engaging means secured to and within said handle, and a spring urging said handle away from said mechanism to yieldably hold said means interengaged and thereby restrain turning of said handle.

2. A sign comprising a sign element having legends and adapted to be moved to display selectively each of its legends, rotary means including a cup-like handle connected to said element for moving the same, a plate adjacent the rim of the handle and forming therewith an enclosure, and releasable interlockable means carried by said plate and handle and disposed in said enclosure.

3. A sign comprising a sign element having legends and adapted to be moved to display selectively each of its legends, rotary means including a cup-like handle connected to said element for moving the same, a wall adjacent the rim of the handle and forming therewith an enclosure, releasable interlockable means connected to said wall and handle and disposed in said enclosure, and a spring for yieldably holding said means interlocked.

4. A sign comprising a rotary part, a spindle having an axially shifting rotary drive connection with said part, a dished handle member on said spindle, a stationary member disposed in said handle member, said members having interengageable means to prevent rotation of said handle member, and a spring for holding said means interengaged, said means being separable

in response to a push on said handle member against the action of said spring.

5. A sign comprising a sign element, rotary driving means connected thereto, a hollow handle drivably connected with said means and having a dog on its inner side, and a gear mounted independently of and disposed within said handle between the base of the handle and said means, said handle being axially movable relative to said gear and so arranged that when the handle is pushed toward said means said dog is released from said gear.

6. A sign comprising a sign element, rotary driving means connected thereto, a hollow handle drivably connected with said means and having a dog on its inner side, a gear mounted independently of and disposed within said handle between the base of said handle and said means, said handle being axially movable relative to said gear and so arranged that when said handle is pushed toward said means said dog is released from said gear, and a spring yieldably preventing releasing movement of said handle.

7. A bearing comprising a member having an inner bearing surface and a transverse slot affording access thereto of a part to be journaled therein, and a slot-closing member for retaining such part in engagement with said surface, said slot-closing member having a bearing surface engageable with such part in opposition to the first-mentioned surface.

8. A bearing comprising a member having a groove providing a part-cylindrical inner bearing surface, a latch movably supported by said member and having a slot adapted to register with said groove to permit a cylindrical element to be moved transversely into engagement with said surface, and spring means yieldably holding said latch in groove-closing position.

9. A sign construction comprising a roller and cooperative bearing members for each end of the roller, said members at one end of the roller being formed to be telescopically assembled and disassembled, said members at the other end of the roller comprising a bearing sleeve having a part provided with a transverse slot affording access and egress of the other member at said other end of the roller, and a latch part associated with said sleeve part and movable relative thereto to close and open said slot, said parts having bearing surfaces engageable with opposed portions of said other member when said slot is closed.

10. A variable sign comprising a support, a fixed arbor thereon, a rotary member on said arbor and adapted to move a sign element, a bevel gear connected to said rotary member, said arbor having an extension beyond said gear, said extension having a bearing opening transverse to the axis of the gear, another bevel gear engaging the first gear and journaled in said opening, and an actuating member drivably connected with said other gear.

11. A variable sign comprising an arbor, a member rotatably mounted on said arbor and adapted to move a sign element, a bevel gear connected to said member, means holding said arbor stationary, another bevel gear engaging the first gear, means comprising bearing surfaces on said arbor and second gear for supporting said second gear, and an actuating member drivably connected with said second gear.

12. A variable sign comprising a movable sign element, a support, an arbor fixed thereto, a rotary driven member journaled on said arbor and operatively connected with said element for moving the same, a drive member in journaled relation to said arbor and in driving relation to said driven member, an actuating handle drivably connected to said drive member and shiftable relative thereto while so connected, means engageable with said handle and fixed to said support for restraining rotation of said handle in a predetermined position of said handle, and yieldable means for maintaining such engagement.

13. A variable sign including a rotary drive mechanism comprising an axially shiftable cup-like handle with its outer side outermost, a stationary member within said handle when said handle is in its inner and outer positions, said member and the inner side of said handle having rotation-restraining means which are free of each other when said handle is in its inner position to permit rotation of said handle and interengaged when said handle is in its outer position to prevent rotation of said handle, and yieldable means within said handle for urging said handle to its outer position.

14. A variable sign including a rotary drive mechanism comprising an axially shiftable cup-like handle with its outer side outermost, a stationary member within said handle when said handle is in its inner and outer positions, said member and said handle having interengageable means which are free of each other when said handle is in its inner position to permit rotation of said handle and interengaged so as to restrain rotation of said handle when said handle is in its outer position, and yieldable means for urging said handle to its outer position, the outer side of said handle having an eccentric opening of a size to admit part of the operator's finger for releasing and rotating said handle.

15. A sign comprising a rotary part, a spindle having an axially shifting rotary driving connection with said part, a dished handle member on said spindle, a stationary member disposed in said handle member, said members having frictionally interengageable means to restrain rotation of said handle member, and a spring for holding said means interengaged, said means being disengageable in response to a push on said handle member against the action of said spring.

16. A bearing comprising a cylindrical part having a slot extending longitudinally of the axis of said part from an end thereof and adapted to rotatably receive a cylindrical element, a collar part rotatable relative to and about said cylindrical part, a stop, a spring yieldably holding said collar part against said stop in slot-closing position and in substantial engagement with said element, said collar part having a slot and being manually turnable against the action of said spring to register the slots for admitting said element to, and enabling said element to be removed from, the first slot.

17. A bearing comprising a cylindrical part having a slot extending longitudinally of the axis of said part from an end thereof and adapted to rotatably receive a cylindrical element, a collar part rotatable relative to and about said cylindrical part, a stop, a spring yieldably holding said collar part against said stop in slot-closing position, said collar part having a slot and being manually turnable against the action of said spring to register the slots for admitting said element to, and enabling said element to be removed from, the first slot, one of said parts

having an annular recess communicating with its slot and the other part having a projection fitting in said recess to maintain said parts assembled, said stop being removable to allow said collar part to turn until said projection is disposed in the slot of said other part whereby said parts may be disassembled and reassembled.

18. An adjusting mechanism for signs and other devices, comprising a bevel gear, a second bevel gear in mesh with the first gear, a third bevel gear mounted to rotate with the second gear and movable into mesh with the first gear to lock all of said gears and movable out of mesh with the first gear to permit rotation of said gears, so that for one revolution of the second and third gears the mechanism may be locked in a number of positions equal to twice the number of teeth in either of the second and third gears.

19. A sign comprising a sign element having legends and adapted to be moved to display selectively each of its legends, rotary means including a handle operatively connected to said element for moving the same, means adjacent the handle and forming therewith an enclosure, and releasable interlockable means carried by the first means and said handle and disposed in said enclosure.

20. A sign comprising a sign element having legends and adapted to be moved to display selectively each of its legends, rotary means including a handle operatively connected to said element for moving the same, a wall adjacent the handle and forming therewith an enclosure, releasable interlockable means connected to said wall and handle and disposed in said enclosure, and a spring for yieldably holding said means interlocked.

21. A bearing comprising a member having an inner bearing surface and a transverse slot affording access thereto of a part to be journaled therein, and a slot-restricting member for retaining such part in engagement with said surface, said slot-restricting member having a bearing surface engageable with such part in opposition to the first-mentioned surface.

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