

Dec. 4, 1934.

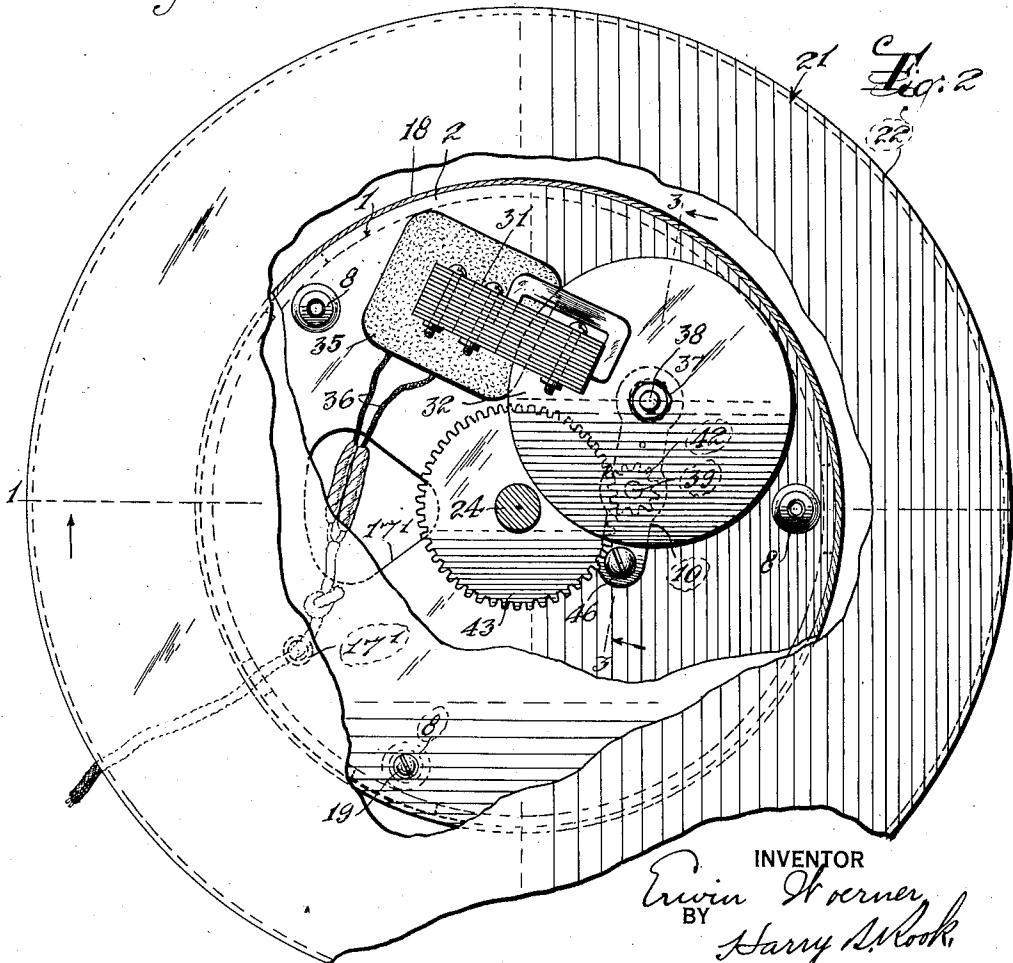
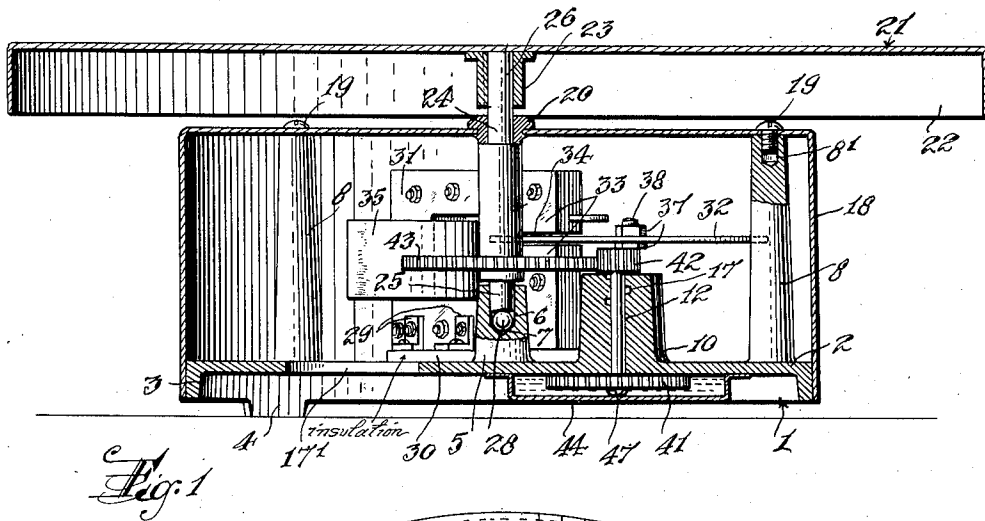
E. WOERNER

1,982,776

DISPLAY TURNTABLE

Filed March 20, 1934

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

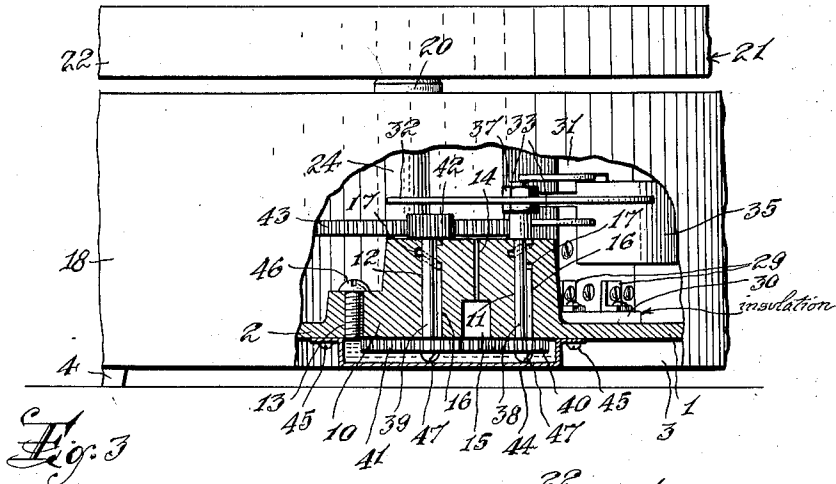


Fig. 3

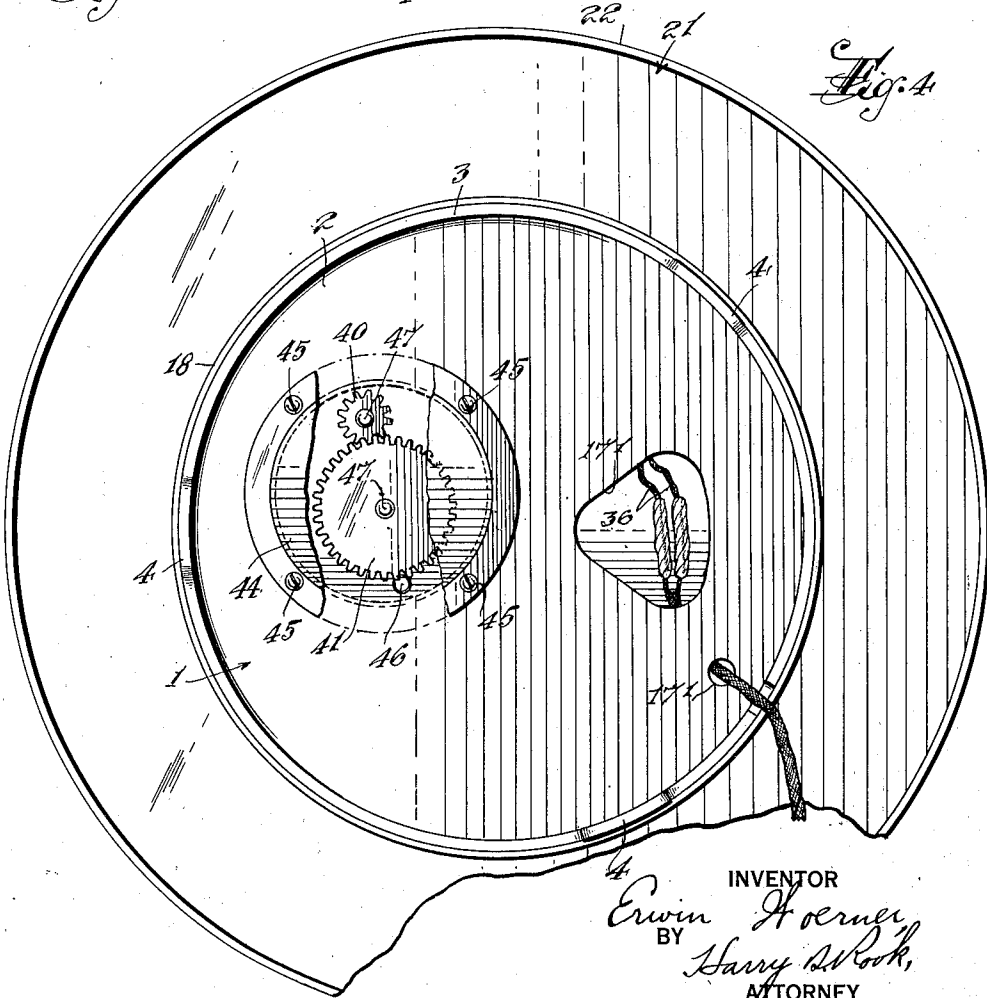


Fig. 4

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1,982,776

DISPLAY TURNTABLE

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Application March 20, 1934, Serial No. 716,444

8 Claims. (Cl. 74-425)

My invention relates to improvements in rotary display apparatus of the turntable type for use in exhibiting articles or material or advertising matter.

5 The principal object of my invention, broadly stated, is to provide apparatus for rotating goods, or the like, for advertising display, which is readily portable, durable, inexpensive to manufacture and operate, and which, as compared with apparatus as now constructed, comprises a smaller number of parts more easily assembled or dis-

10 assembled as desired. More specifically my invention is directed toward providing a simplified efficient turntable apparatus for the purpose above set forth, and a novel mounting and relation of motor drive parts thereof together with improved lubricating means for said parts whereby a low powdered motor may be used to rotate the load on the table and the cost of operation and repair reduced to a minimum.

15 Another important object of my invention is to combine in a single unit a number of the parts of the machine for incorporation, as a unit, in the machine to thereby reduce the number of assembling operations and the cost of manufacture.

20 Other and subordinate objects will presently appear and the nature of my improvements will be more clearly understood when the following description and claims are read in conjunction with the drawings accompanying and forming part of this specification.

In the drawings:

25 Figure 1 is a view in transverse section, taken on the line 1-1 of Figure 2 and illustrating a preferred embodiment of my novel display apparatus.

Figure 2 is a view in top plan with parts broken away and other parts shown in section.

30 Figure 3 is a fragmentary view partly in section and taken on the line 3-3 of Figure 2, and Figure 4 is a view in bottom plan.

35 Describing now specifically the illustrated embodiment of my invention the numeral 1 designates the base proper of the apparatus which has the form of a circular plate 2 provided with a downturned marginal flange 3 from which depend a series of short legs 4. Upstanding from said plate 2 axially thereof is a short bearing sleeve 5 having a central bore 6 terminating in a conical seat 7. The function of said sleeve 5 will presently appear. Adjacent the edge of the plate 2 is a series, preferably three, of equidistantly spaced posts 8 having threaded apertures 8' in their upper ends and relatively higher than the

sleeve 5. At one side of the sleeve 5 is an elongated stepped bearing boss or block 10 arising from the plate 2 to substantially the height of said sleeve 5 and extending chordally of said plate. The boss 10 has a vertically disposed through bore 11 adjacent one end thereof a similar bore 12 located midway of its ends, and a threaded through bore at its other end as at 13. An air vent duct 14, enlarged at its lower end as at 15, extends vertically through the boss 10 intermediate the bores 11 and 12. Associated with the bores 11 and 12 are oil grooves 16 parallel therewith and opening thereinto, said grooves extending from the bottom of the plate 2 and terminating at their upper ends in helical grooves 17. At the side of the sleeve 5 opposite the boss 10, two openings 17' are provided in the plate 2. The purpose of the posts 8, boss 10, and features described in connection therewith, will presently appear.

40 The plate 2, sleeve 5, posts 8 and boss 10 are preferably formed of light inexpensive metal, for instance cast iron, and they are shown as cast or otherwise formed as a single piece manufacturing unit having the before described bores, duct and oil grooves therein.

45 Supported on top of the posts 8 is a circular sheet metal cover or casing 18 having a flat top and an open bottom and of the requisite size to fit snugly at its lower edge against the flange 3 of the base plate 2. Preferably the casing 18 is also of steel, or other light inexpensive metal. Screws 19 threaded into the apertures 8' retain the casing in position. A bearing collar 20 is suitably secured in the top of the casing 18 in axial alignment with the sleeve 5.

50 Surmounting the casing 18 is a flat circular turntable 21, also preferably formed of steel, and having a down turned marginal reinforcing flange 22, and a depending axial sleeve 23 secured thereto. The turntable 21 is rotatably mounted in the sleeve 5 and collar 20 by means of a vertical table rotating shaft 24 having a reduced lower end 25 journaled in the bore 6 of said sleeve, and a reduced upper end 26 journaled in said collar 20, the sleeve 23 of said table being removably fitted over said end. A single ball bearing 28 interposed between the lower end of said shaft 24 and the seat 7 of the sleeve 5 sustains the entire weight of the table and load thereon.

55 Within the casing 18 is a motor drive for said shaft 24 and table 21 as follows.

Secured to the plate 2, as by brackets 29, and insulated from said plate by an insulating pad 30 is a motor 31. Any suitable form of motor

may be utilized but preferably an electro-magnetic motor is used of the type embodying a horizontal disc-like rotor 32 interposed between the poles 33 of a stator core, as at 34, and having a stator winding as at 35, adapted to be connected by leads 36 passing over one aperture 17' and through the other for connection to the house current. The aperture 17' over which the leads 36 pass, it will be noted, provides for ventilation of the casing 18.

The rotor 32 is fixed as by opposed nuts 37 to the upper end of a drive shaft 38 journaled in the before mentioned bore 11 and having its lower end projecting below the boss 10, or plate 2. Journaled in the before-mentioned bore 12 is a similarly arranged jack shaft 39 and interposed between the drive shaft 38 and the table rotating or driven shaft 24 is a train of reduction gearing including a small gear 40 fast on the lower end of said shaft 38 and meshing with a larger gear 41 fast on the lower end of the jack shaft 39, and small gear 42 fast on the upper end of said jack shaft 39 and meshing with a large gear 43 fast on the lower end of the table rotating shaft 24.

Beneath the boss 10 and gears 40 and 41 is a combined oil container and bearing member in the form of a flat pan 44 secured to the plate by screws 45 and communicating at one end with the threaded bore 13 through which oil may be introduced into said pan. A screw plug 46 may be provided for closing the bore 13 after filling said pan. The lower ends of the drive shaft 38 and jack shaft 39 are somewhat enlarged and are rounded to provide anti-friction members 47 bearing on the bottom of said pan whereby the latter acts as an end thrust bearing member supporting downward thrust of said shafts.

In the operation of my novel display apparatus the motor 31 having first been energized, as by means of the usual switch not shown, the drive shaft 38 is rotated to drive the jack shaft 39 and table rotating shaft 24 through the described gearing, as will be clear, the gears 40 and 41 and anti-friction members 47 running in oil. Due to capillary action the oil is drawn from the pan 44 upwardly through the grooves 16 and into the helical grooves 17 thereby lubricating the shafts 38 and 39 throughout their entire length. In this connection it is to be noted that the grooves 17 are reversely coiled relative to the direction of rotation of the shafts 38 and 39 whereby the upward flow of oil is retarded and said oil pocketed so that a minimum amount escapes from the upper ends of said grooves and bores. Obviously some oil escapes however which is taken up by the gear 42 through wiping action thereof against the top of the boss 10 it being understood that said gear is close enough to said boss for this purpose. Such escaping oil lubricates the gears 42 and 43 and any excess oil drains back into the pan 44 through the vent duct 14.

The described structure provides a light, strong and readily portable display apparatus operative under a maximum load by a low powered motor. This is due on the one hand to the fact that substantially the entire load of goods on the table is sustained by the single ball bearing 28 thus reducing friction incident to rotation of said table to a minimum, and on the other hand to the fact that the gears 40 and 41 run in oil and to the anti-friction mounting of said shafts on said pan 44. The single piece base having the sleeve 5, posts 8, and boss 10, provides

a unit which saves assembling and disassembling operations and which may be more economically manufactured as such a unit than in separate parts.

While I have shown and described a preferred embodiment of my invention it should be understood that many modifications and changes may be made in the details of construction without departing from the spirit of the invention.

Having thus described my invention, what I claim is:

1. Apparatus of the class described comprising, a circular base plate having projecting upwardly therefrom an axial bearing sleeve, an elongated bearing block, and a series of posts adjacent its marginal edge, a circular casing supported by said posts and having an axial bearing collar in the top thereof, a driven shaft journaled at its opposite ends in said sleeve and collar, respectively, and extending at one end above said casing, a turn table mounted on the projecting end of the shaft, and a motor drive for said shaft including, drive and jack shafts, respectively, journaled in said block and projecting above said block and below said plate, intermeshing gears on the lower ends of said drive and jack shafts, and a gear drive from the upper end of said jack shaft to said driven shaft.

2. Apparatus of the class described comprising, a circular base plate having projecting upwardly therefrom an axial bearing sleeve, and an elongate bearing block, a circular casing surmounting said plate and secured thereto said casing having an axial collar in the top thereof, a driven shaft journaled at its lower and upper ends in said sleeve and collar, respectively, the upper end of said shaft extending above said casing, a turn table mounted on the projecting end of said shaft, an anti-friction ball interposed between the lower end of said shaft and the bottom of said sleeve and supporting said shaft and table, and a motor drive for said shaft including, drive and jack shafts, respectively journaled in said block and projecting above said block and below said plate, an oil pan secured to said plate below said drive and jack shafts, intermeshing gears on the lower ends of said drive and jack shafts and within said pan, and a gear drive from the upper end of said jack shaft to said driven shaft.

3. Apparatus of the class described comprising, a circular base plate having an axial bearing sleeve projecting upwardly therefrom, and an elongate bearing block, an oil pan secured to the underside of said plate beneath said block, a casing surmounting said plate and secured thereto, a driven shaft journaled at its lower end in said sleeve and having its upper end projecting through the top of the casing, a turntable mounted on the projecting end of said shaft, an anti-friction ball interposed between the lower end of said shaft and the bottom of said sleeve and supporting said shaft and table, and a motor drive for said shaft including, vertically disposed drive and jack shafts, respectively, journaled in said block and having enlarged lower rounded ends projecting below said plate and bearing upon the bottom of said pan to provide an anti-friction end thrust bearing for said drive and jack shafts, intermeshing gears on said drive and jack shafts within said pan, and a gear drive from the upper end of said jack shaft to said driven shaft.

4. Apparatus of the class described comprising a base plate including an integral bearing block provided with a pair of vertical bores extending therethrough and individual longitudinal oil feed-

- ing grooves for said bores coextensive therewith and terminating at their upper ends in helical grooves, an oil pan secured to said plate beneath said block and forming a closed chamber there-
 5 with communicating with said bores, a casing surmounting said plate and secured thereto, a vertically disposed driven shaft having a bearing at its opposite ends in said plate and casing, respectively, the upper end projecting above said
 10 casing, a turntable mounted on the upper end of said shaft and a motor drive for said shaft including, drive and jack shafts journaled in said bores, respectively, said drive and jack shafts projecting at their upper ends above said block and having lower rounded ends bearing upon the
 15 bottom of said pan to provide an anti-friction end thrust bearing for said drive and jack shafts, intermeshing gears on the lower ends of said drive and jack shafts within said pan, and a gear drive between the upper end of said jack shaft and said
 20 driven shaft.
5. Apparatus of the class described comprising, a base plate including an integral bearing block provided with a pair of vertical bores extending
 25 therethrough and individual longitudinal oil grooves for said bores coextensive therewith and terminating at their upper ends in helical grooves, an oil pan secured to said plate below said bores, a turntable device including a driven shaft, and a
 30 motor drive for said shaft including, drive and jack shafts, respectively, journaled in said bores said drive and jack shafts projecting above said block and into said pan, intermeshing gears on said drive and jack shafts within said pan, and
 35 operating connections between the upper end of the jack shaft and said driven shaft said helical coils being reversely arranged relative to the direction of rotation of their related shafts.
6. Apparatus of the character described comprising a horizontal base plate provided with an
 40 integral bearing block having a pair of parallel bores extending therethrough, a shaft journaled in each of said bores, an oil pan on the underside of said base plate forming an oil chamber between said pan and base plate, the lower end of each of said shafts having a direct thrust bearing
 80 on said oil pan, intermeshing gears on said shafts within said chamber, means at the upper end of one shaft for effecting a driving connection with a motor, a driven shaft journaled in said base plate, and a gearing connection between
 85 the upper end of the other of the two first-mentioned shafts and said driven shaft.
7. Apparatus of the class described comprising a base plate including an integral bearing block provided with a pair of vertical bores extending therethrough and individual longitudinal
 90 oil feeding grooves for said bores coextensive therewith and terminating at their upper ends in helical grooves, an oil pan secured to said plate beneath said block and forming a closed chamber therewith communicating with said bores, a vertically
 95 disposed driven shaft journaled in said base plate, and a motor drive for said shaft including, drive and jack shafts journaled in said bores, respectively, said drive and jack shafts projecting at their upper ends above said block and
 100 having lower rounded ends bearing upon the bottom of said pan to provide an anti-friction end thrust bearing for said drive and jack shafts, intermeshing gears on the lower ends of said drive and jack shafts within said pan, and a gear
 105 drive between the upper end of said jack shaft and said driven shaft.
8. Apparatus of the character described comprising a horizontal base plate having shaft bearing opening therethrough, a shaft journaled in
 110 said bearing, an oil pan on the underside of said base plate forming an oil chamber between said pan and base plate, the lower end of said shaft having a direct thrust bearing on said oil pan, and means for connecting said shaft to a source
 115 of power and to a driven shaft.

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