Dec. 8, 1953 D. B. JOHNSTON 2,661,627

TURNTABLE DRIVE

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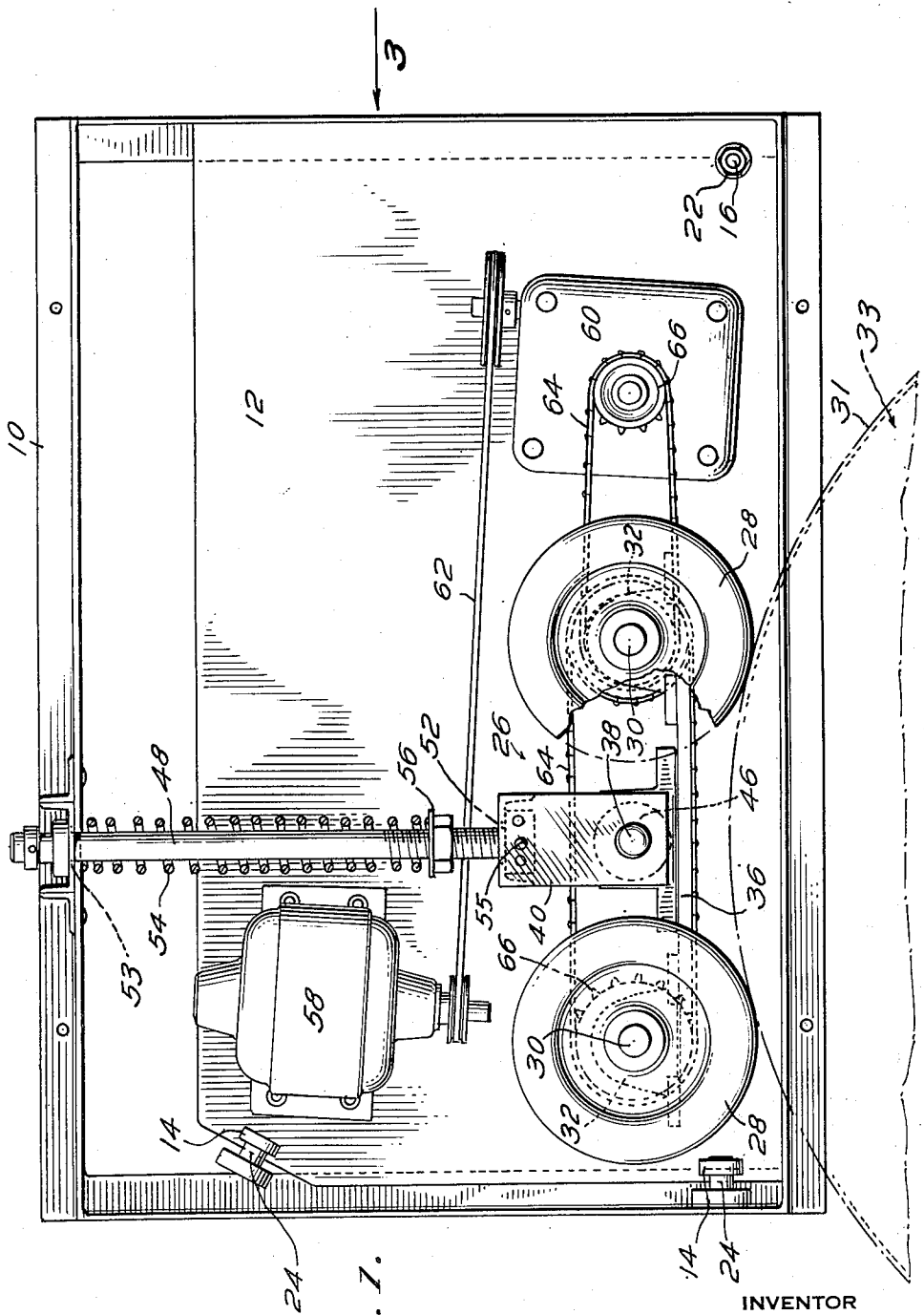


Fig. 1.

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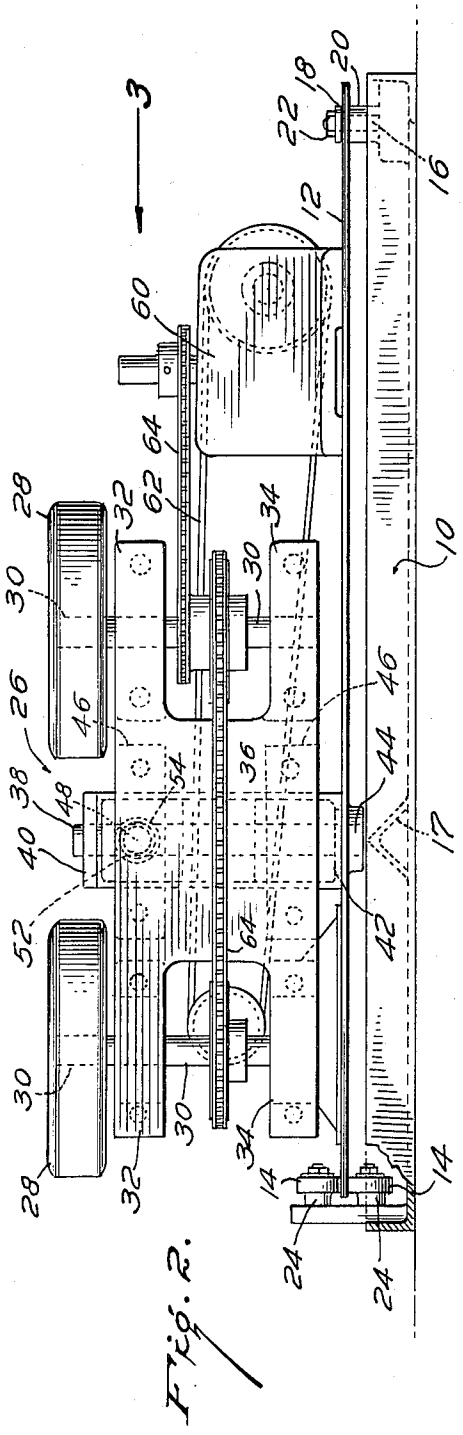


Fig. 2.

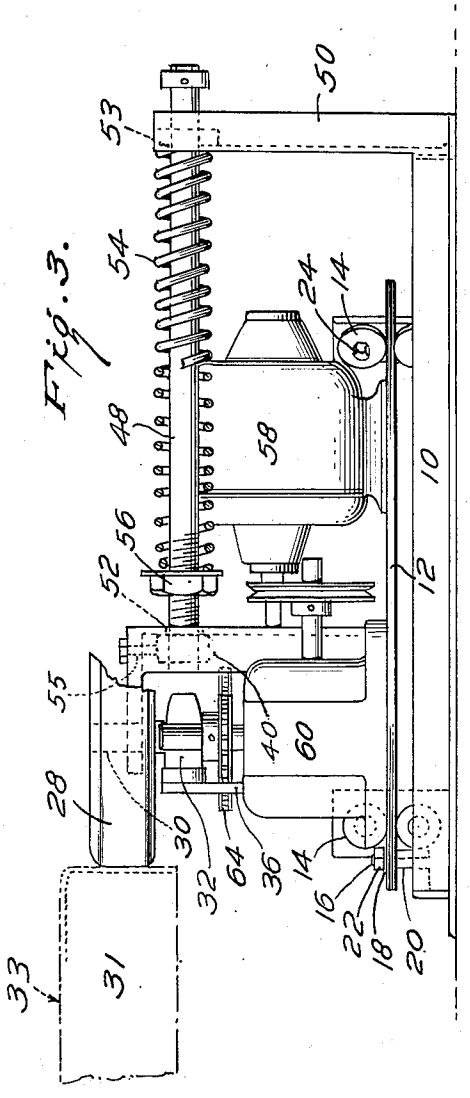


Fig. 3.

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TURNTABLE DRIVE

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9 Claims. (Cl. 74—209)

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This invention relates to a drive mechanism and more particularly to a friction drive for imparting rotary motion to a turntable.

An object of the present invention is to provide a drive mechanism so mounted and arranged that it compensates for both major variances and local irregularities in the main drive ring of a turntable.

A further object is to provide a dual drive system which permits smooth operation of even large, heavy duty turntable units.

Another object is the provision of a pair of driven wheels which pivot as a unit and are spring-urged continually into frictional engagement with the main drive ring of a turntable unit to rotate the turntable with a positive driving action, thus an out-of-roundness of the turntable periphery will not prevent the driving means from rotating the turntable efficiently and continuously.

A further object is to provide a driven unit having two rotating wheels instead of a single wheel so that twice the frictional force will be applied along the peripheral edge of the turntable assembly. A single source of power drives both rotating wheels.

Another object is the provision of a spring-loaded pair of driving wheels wherein the spring tension on the driving wheels may be adjusted to suit various turntable driving requirements.

The above and other features, objects and advantages of the present invention will be fully understood from the following description considered in connection with the accompanying illustrative drawings.

In the drawings:

Fig. 1 is a top plan view of the drive mechanism embodying the invention with parts broken away for the purpose of clarity;

Fig. 2 is a front elevation view thereof;

Fig. 3 is a side elevation view along line 3 of Figs. 1 and 2 with parts broken away and omitted for the sake of clarity.

Referring to the drawings in detail, the compensating drive mechanism embodying the present invention is here utilized to operate a turntable, but it should be understood that this drive mechanism may also be used to propel other objects having circular driving surfaces. The drive mechanism has a frame member 10. A base plate 12 is maintained in substantially parallel-spaced relation to said frame member 10 preferably by means of two pairs of rollers 14 and bolt 16. As seen in Fig. 2, angle 17 may be placed on frame member 10 to act as a stiffening device

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for said frame member. Bolt 16 has one end secured to frame member 10 while the other end protrudes through a hole 18 in base plate 12. A bearing sleeve or bushing 20 fits over and surrounds a portion of bolt 16 and a cap or nut 22 is fastened to the other end of bolt 16. Bearing sleeve 20 and cap 22 combine to hold the base plate 12 therebetween and in its proper operating position. Rollers 14 are each mounted in pairs on frame 10 by means of axles 24. As clearly seen in Fig. 2, each pair of rollers 14 is aligned vertically and in spaced relationship with their axes in parallel planes so that base plate 12 may fit snugly therebetween.

A driven unit referred to generally by the numeral 26 is mounted on base plate 12 for pivotal movement. Driven unit 26 preferably comprises a pair of rubber wheels 28 which are secured to shafts or axles 30 and are adapted to engage and rotate drive ring 31 of turntable 33. Shafts 30 are maintained in intermediate bearings 32 and end bearings 34. Bearings 32 and 34 are secured to a tie plate 36, thus causing the two rubber wheels 28 to pivot as a unit as well as rotate individually. This pivotal action is accomplished by means of a shaft 38 positioned medially between rubber wheels 28. One end of shaft 38 is journalled through a bracket 40 which bracket is welded or otherwise secured to base plate 12. The other end of shaft or rod 38 is journalled through base plate 12 and secured to the same by means of a washer 42 and a cap 44. Located on tie plate 36 intermediate of its ends is another pair of bearings 46. Shaft 38 is adapted to pass through bearings 46 thereby permitting pivotal movement of the driven unit 26 about shaft 38.

As seen in Fig. 3, a relatively long rod or shaft which is partially threaded has one of its ends passing through opening 53 of an upstanding channel member 50. Channel member 50 is bolted or otherwise secured to the frame member 10. The other end of shaft 48 passes through an opening 52 in bracket 40 and is secured to bracket 40 by any suitable means, for example by a pin 55. Openings 52 and 53 are larger in diameter than shaft 48 thereby permitting shaft 48 slight freedom of movement laterally. A compression spring 54 surrounds shaft 48 and is trapped by said channel member 50 at one end and an adjustable collar or nut 56 in the proximity of the other end of shaft 48. The amount of spring pressure on the rubber wheels 28 may be varied by the turning of nut 56. Thus, the utilization of compression spring 54 furnishes

a spring-loaded driven unit that may pivot on shaft 38.

The driving means for the driven unit 26 includes a motor 58 and a speed reducer 60. As clearly seen in Fig. 1, the motor drives the speed reducer through a belt 62, and the speed reducer in turn drives the rubber wheels 28 through the medium of chains 64 and sprockets 66.

It is to be understood that rubber wheels 28 may engage either the inner or outer side of the drive ring 31 of turntable 33 to rotate said turntable.

The compensating drive mechanism embodying the present invention operates as follows: The base plate 12 pivots on bearing sleeve 20 of bolt 16. The rollers 14 permit the base plate to pivot in a horizontal plane, but restrict movement of the base plate in vertical planes. The ability of the drive mechanism to pivot in a horizontal plane allows the rubber wheels 28 to follow the circumference of drive ring 31 of turntable 33, and to be maintained in uninterrupted contact therewith. This action of the drive mechanism is aided by means of spring 54 and the ability of rod 48 to slide freely in openings 52 and 53. This compensates for major variations in the curvature of the drive ring 31. In addition to the foregoing assembly the driven unit 26 including the two rubber driving wheels 28 also pivots about the shaft 38. Th rubber wheels are spring-urged into engagement with the drive ring 31 to follow local irregularities in drive ring 30 such as may occur at the jointure of ring segments, and the construction of this assembly further ensures that the load transmitted by the spring 54 is equally divided between the two rubber wheels 28.

While I have shown and described the preferred embodiment of my invention, it will be understood that the latter may be embodied otherwise than as herein specifically illustrated or described, and that in the illustrated embodiment certain changes in the details of construction and in the arrangement of the parts may be made without departing from the underlying idea or principle of the invention within the scope of the appended claims.

I claim:

1. In a drive mechanism for operating a turntable comprising a base plate, mounting means for said base plate, said mounting means being adapted to coact with said base plate to permit limited pivotal movement of said base plate in one plane but restrict movement in other planes, driving means mounted on said base plate, a driven unit also mounted for limited pivotal movement independent of said limited pivotal movement of said base plate, a rotating element in said driven unit driven by said driving means and adapted to engage and rotate said turntable.

2. In a drive mechanism for operating a turntable comprising a drive ring secured to said turntable, a base plate, mounting means for said base plate, said mounting means being adapted to coact with said base plate to permit limited pivotal movement of said base plate in one plane but restrict movement in other planes, driving means mounted on said base plate, a driven unit also mounted for limited pivotal movement independent of said limited pivotal movement of said base plate, at least one wheel in said driven unit driven by said driving means and adapted to engage said drive ring to rotate said turntable.

3. In a drive mechanism for operating a turntable comprising a base plate, mounting means for said base plate, said mounting means being adapted to coact with said base plate to permit limited pivotal movement of said base plate in one plane but restrict movement in other planes, a motor on said base plate, a speed reduction mechanism on said base plate, a unit driven by said speed reduction mechanism and also mounted for limited pivotal movement independent of said limited pivotal movement of said base plate, a rotating element in said unit adapted to be spring-urged into engagement with said turntable to rotate said turntable.

4. In a drive mechanism for operating a turntable comprising a base plate, mounting means for said base plate, said mounting means including at least one pair of rollers, said base plate being positioned between said pair of rollers to permit limited pivotal movement of said base plate in one plane but restrict movement in other planes, a motor on said base plate, a speed reduction mechanism on said base plate, a unit driven by said speed reduction mechanism and also mounted for limited pivotal movement independent of said limited pivotal movement of said base plate, a rotating element in said unit driven by said speed reduction mechanism and adapted to engage and rotate said turntable.

5. In a drive mechanism for operating a turntable, a drive ring secured to said turntable, a base plate, mounting means for said base plate, said mounting means including at least one pair of rollers, said base plate being positioned between said pair of rollers to permit limited pivotal movement in one plane but restrict movement in other planes, driving means mounted on said base plate, a driven unit also mounted for limited pivotal movement independent of said limited pivotal movement of said base plate, at least one wheel in said driven unit being propelled by said driving means and adapted to engage said drive ring to rotate said turntable.

6. In a drive mechanism for operating a turntable comprising a base plate, mounting means for said base plate, said mounting means including at least one pair of rollers, said base plate being positioned between said pair of rollers to permit limited pivotal movement of said base plate in one plane but restrict movement in other planes, said base plate being adapted to pivot at a point remote from said rollers, driving means mounted on said base plate, a driven unit also mounted for limited pivotal movement, a rotating element in said driven unit driven by said driving means and adapted to engage and rotate said turntable.

7. In a drive mechanism for operating a turntable, a frame member, a movable base plate, mounting means for said base plate, said mounting means being adapted to maintain said base plate in substantially parallel-spaced relation to said frame member and to coact with said base plate to permit limited pivotal movement of said base plate relative to said frame member in a horizontal plane but restrict movement in other planes, driving means mounted on said base plate, a driven unit also mounted for limited pivotal movement independent of said limited pivotal movement of said base plate, a rotating element in said driven unit driven by said driving means and means mounted on said frame member for urging said rotating element into engagement with said turntable.

8. In a drive mechanism for operating a turntable comprising a base plate, mounting means for said base plate, said mounting means being adapted to coact with said base plate to permit

limited pivotal movement of said base plate in one plane but restrict movement in other planes, driving means mounted on said base plate, a driven unit having a pair of wheels pivotally mounted on said base plate at a point located between said wheels, said wheels being mounted for limited pivotal movement as a unit independent of the pivotal movement of said base plate, said wheels being driven by said driving means and adapted to engage and rotate said turntable.

9. In a drive mechanism for operating a turntable comprising a base plate, mounting means for said base plate, said mounting means being adapted to coact with said base plate to permit limited pivotal movement of said base plate in one plane but restrict movement in other planes, roller means being positioned on an edge portion of said base plate, said base plate being adapted

for limited pivotal movement therebetween, driving means mounted on said base plate, a driven unit on said base plate having a pair of wheels pivoting on said base plate at a point located between said pair of wheels, said unit being propelled by said driving means and adapted to engage and rotate said turntable.

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