

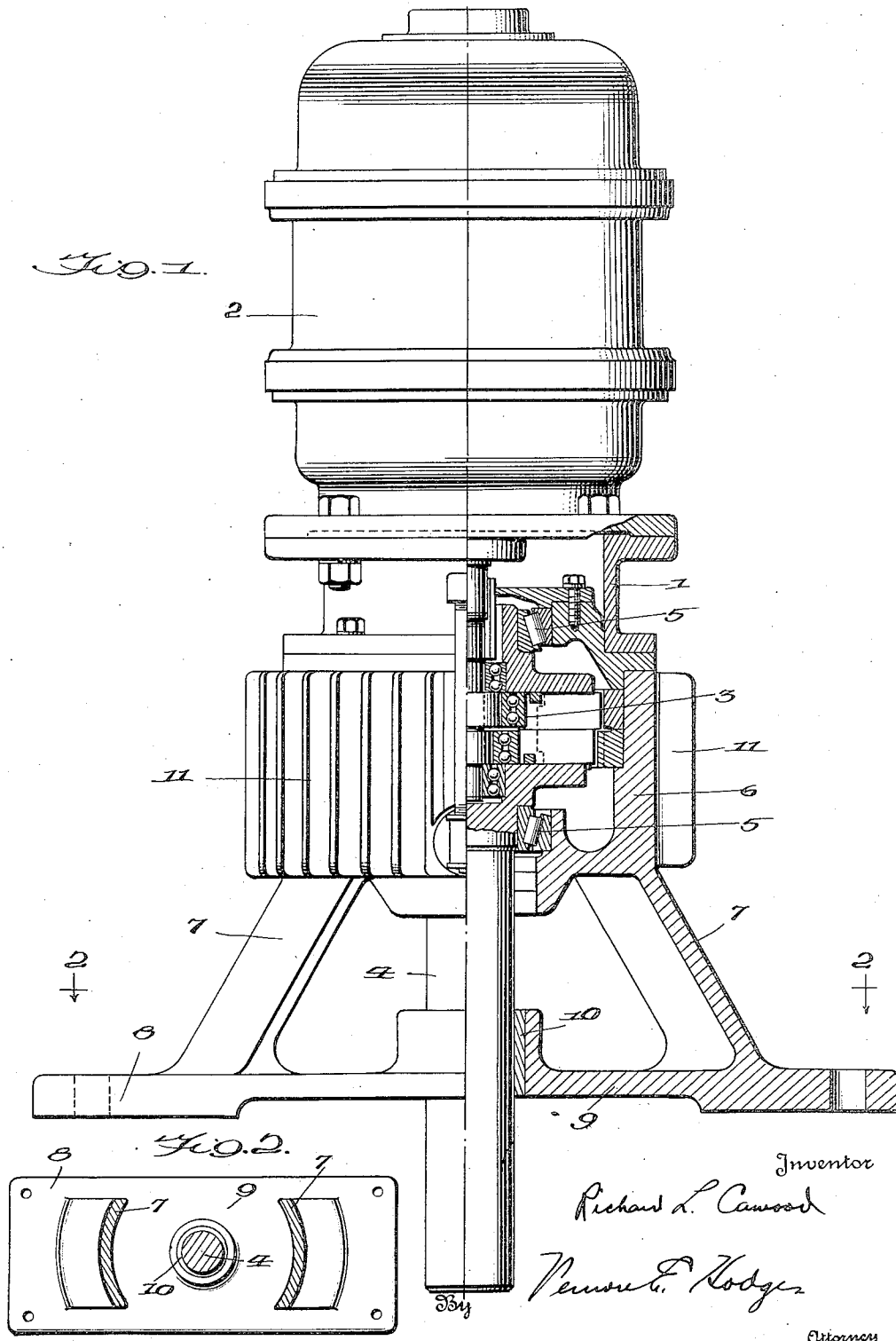
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AGITATOR DRIVE

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AGITATOR DRIVE

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8 Claims. (Cl. 74—189)

This invention relates to an improvement in agitator drives.

An agitator drive of the motor driven variety usually consists of a motor and a speed reducer to reduce the speed of the motor to the low speed required in agitation and it is usual to depend on the bearings of the speed reducer to care for the radial and side thrust of the agitator shaft. In mixing heavy and viscous materials, the side thrust is considerable and unless a step bearing is placed in the bottom of the tank or other receptacle in which the agitator is used, the shaft is twisted and distorted, bending it out of its normal perpendicular position, increasing horse power, sometimes allowing stirrer blades to come in contact with side of receptacle and sometimes injuring the speed reducer bearings, thus shortening the life of the entire mechanism.

The object of this invention is to provide drive equipment for an agitator capable of direct connection with the agitator and a motor and which is of such a nature that the side thrust of the agitator is taken care of by a special thrust bearing built into the frame of the agitator drive at a point some distance from the bearings of the reducer section of the drive, being located in the bed plate of the agitator drive, the wide spacing of the bearings making it possible to absorb the side thrust imposed on the agitator shaft by the resistance of the material to the pressure exerted by the stirrer blades of the agitator.

The object of my invention is accomplished by the use of a frame on the upper part of which is mounted a vertical electric motor while in the center section is located the speed reducer. The bottom section extends downward below the speed reducer, the section below flaring outwardly to brace the unit and terminating in a heavy base in the center of which is built the guide bearing to which reference has been made. This guide bearing is of the oilless type, thus preventing oil from leaking from it and dripping downward and into the product being stirred.

A common fault of speed reducers in general and with those in particular that are operated continuously is that the temperature rises until the reducer is quite warm. To overcome this, I have provided on the reducer a series of fins or ribs, which may be either vertical or circumferential, and which substantially increase the radiation of the heat generated by the reducer, permitting it to operate at a much lower temperature than would otherwise be possible.

In the accompanying drawing,

Fig. 1 is a vertical quarter section through the

agitator drive, showing parts in elevation; and

Fig. 2 is a horizontal sectional view through the base, on the line 2—2 of Fig. 1, on a somewhat reduced scale.

My invention is shown applied to an agitator drive of a construction having a casing 1 supporting an electric motor 2, the armature shaft of which is connected by a speed reducer 3 to a drive shaft 4 adapted to be connected to the agitator shaft. Anti-friction bearings such as roller bearings 5 serve to support the speed reducer 3 and the adjacent ends of its shaft. One of the bearings 5 is mounted in a web in casing 1 and the other bearing is in a base 6 supported upon the integral legs 7 which are shown in Fig. 2 as being of arcuate form in cross section and which are integral with a base plate 8 and extend upwardly therefrom. Between the legs 7 and integral with the base plate 8 and the legs, is a web 9 which is solid except for an oilless bearing 10 receiving the drive shaft 4 and closely surrounding the shaft, so as to form a bearing therefor. This prevents the leakage of oil from the main portion of the drive along the shaft 4 into the container of the agitator.

The third bearing formed at 10 adapts the drive to special service of direct connection with the agitator which would be impractical without it and there is no danger of having oil leaking into the container of the agitator by reason of the location of the drive thereabove.

The drive shaft 4 is adapted for direct connection with the shaft of the agitator connected with the stirrers in the agitator for driving the same and the drive may be mounted directly on top of the agitator, or on another support thereabove.

When the agitator is used for mixing heavy or viscous materials, the side thrust on the agitator shaft is considerable and unless the shaft is securely braced as by a step bearing in the bottom of the tank or receptacle of the agitator, the shaft is frequently twisted and distorted bending it out of its normal perpendicular position, which is injurious to the agitator. By the use of the bearing 10 rigidly braced in the base plate 8, the agitator drive is held against side thrust, thereby preventing injury to the agitator blades or shafts and at the same time preventing oil from leaking downward into the agitator.

In order to prevent overheating of the base 6 by continuous operation of the speed reducer 3, I have provided on the periphery of the base 6 a series of fins or ribs 11, which may be either vertical or circumferential and which substan-

tially increase the radiation of the heat generated by the reducer permitting it to operate at a much lower temperature than would be possible otherwise.

5 I claim:

1. In an agitator drive of the character described, the combination of power means, speed reducing means connected to said power means, a base supporting the power means and the speed reducing means, a pair of anti-friction bearings for said speed reducing means and disposed on opposite sides thereof, a drive shaft connected to said speed reducing means, a base plate spaced from said speed reducing means and supporting the base, and a third bearing for the drive shaft mounted in said base plate.

2. In a drive of the character described, the combination of power means, a base supporting said power means, speed reducing means housed within the base and connected to the power means, a pair of anti-friction bearings mounting the speed reducing means and disposed on opposite sides thereof, a drive shaft connected to the speed reducing means and extending downwardly therefrom, supporting legs for the base, a base plate supporting the legs, said base plate, legs, and base being integral, and a third bearing receiving and forming a bearing support for the drive shaft and disposed below the pair of bearings, said third bearing having a support integral with the base plate, legs, and base and rigidly journaling the drive shaft.

3. In an agitator drive, the combination of a base plate having inclined legs extending upwardly therefrom and integral therewith, a base integral with and supported by the legs, a speed reducer mounted in the base, bearings supporting at least part of the speed reducer and disposed on opposite sides thereof, and a drive motor connected to the speed reducer and mounted on the base.

4. In an agitator drive, the combination of a base plate having inclined legs extending upwardly therefrom and integral therewith, a base integral with and supported by the legs, a speed reducer mounted in the base, bearings supporting at least part of the speed reducer and dis-

posed on opposite sides thereof, a drive motor connected to the speed reducer and mounted on the base, and a drive shaft connected to the speed reducer, the base plate having an integral central web provided with a bearing therein receiving and journaling the drive shaft.

5. In a drive of the character described, the combination of a base having supporting legs and a base plate integral therewith, speed reducing means carried by the base, a pair of coaxial anti-friction bearings supporting at least part of the speed reducing means and disposed on opposite sides thereof, and a third bearing for the drive shaft having its support integral with the base, legs, and base plate, and rigidly journaling the drive shaft at a point spaced a substantial distance below the pair of bearings.

6. In a drive of the character described, the combination of supporting base structure adapted to receive an upright drive shaft, and a web carried by said base structure and having an opening therein closely receiving the periphery of the drive shaft, said web preventing the draining of oil downwardly along the drive shaft to a point below the web.

7. In a drive of the character described, a base having a chamber therein adapted to receive and enclose speed reducing means, and having means for mounting a drive motor thereon, legs supporting said base, and a web attached to the legs and spaced below the base, said web having a bearing therein in position to journal a shaft depending from the speed reducer, said base, legs, and web being integral for rigidity of support and reducing side thrust of the shaft.

8. In a drive of the character described, the combination of power means, speed reducing means connected with the power means, a base supporting the power means and speed reducing means, a drive shaft connected with the speed reducing means and depending therefrom, and supporting structure for the base having a bearing spaced below the base and journaling the drive shaft for reducing side thrust thereof.

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