

W. L. D'OLIER.
DRIVING MECHANISM FOR CENTRIFUGALS.

APPLICATION FILED APR. 6, 1903.

2 SHEETS—SHEET 1.

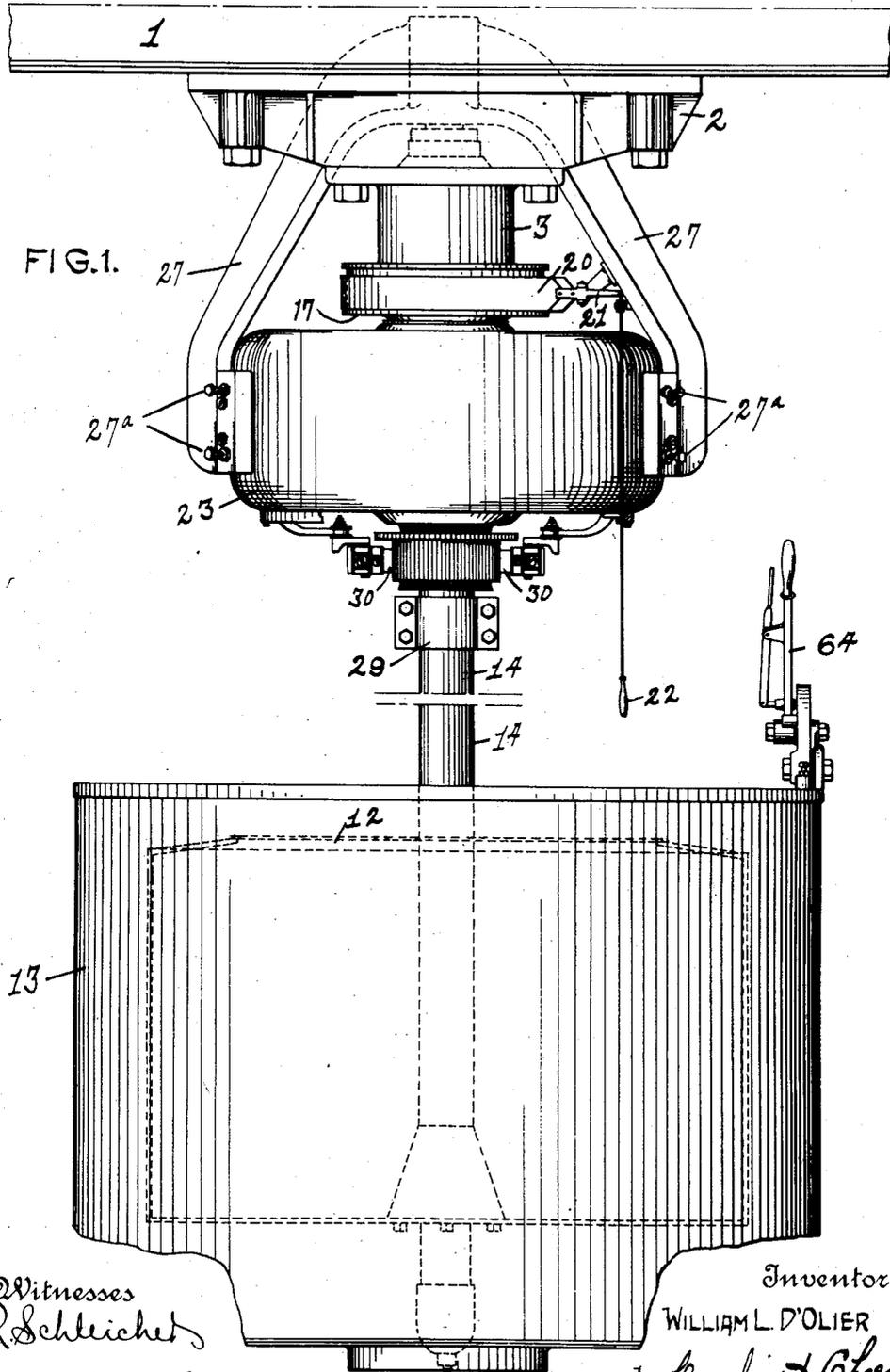


FIG. 1.

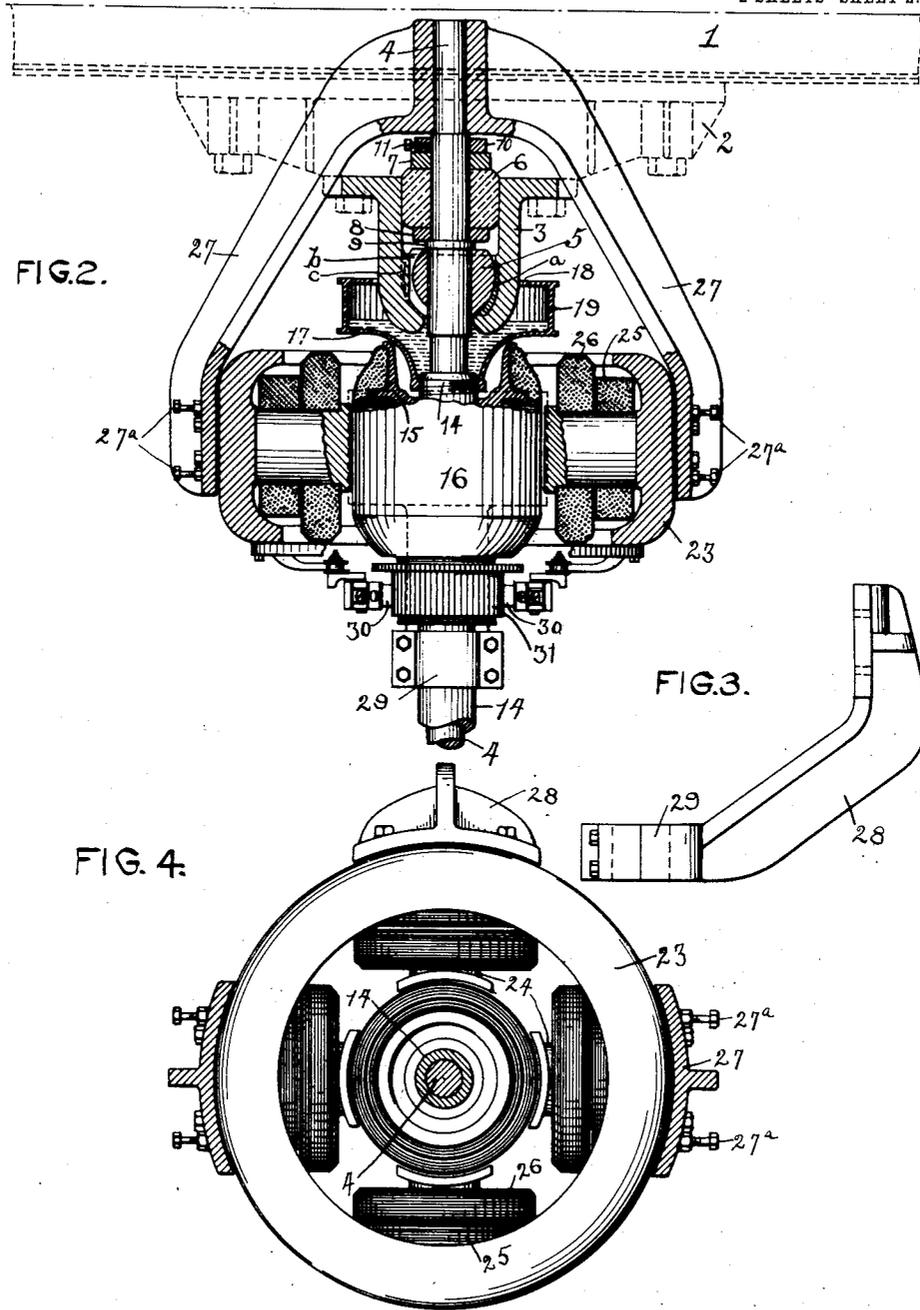
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UNITED STATES PATENT OFFICE.

WILLIAM L. D'OLIER, OF PHILADELPHIA, PENNSYLVANIA.

DRIVING MECHANISM FOR CENTRIFUGALS.

No. 830,474.

Specification of Letters Patent.

Patented Sept. 4, 1906.

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To all whom it may concern:

Be it known that I, WILLIAM L. D'OLIER, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Driving Mechanism for Centrifugals, of which the following is a specification.

It is the object of my invention to provide an electric-motor drive for a centrifugal machine, the motor and centrifugal basket being adapted to gyrate together about a common point of support; and it is particularly the object of my invention to gain a saving in vertical height or head room in the combined motor and centrifugal apparatus. To this end the motor-armature is brought as close up to the hanger as possible, and the bracket for supporting the motor-field element extends upwardly beyond the hanger and is secured upon an inner spindle.

My invention resides, further, in features hereinafter pointed out and claimed.

Reference is to be had to the accompanying drawings, in which—

Figure 1 is a general view in elevation of the electric motor as applied to a centrifugal machine. Fig. 2 is a vertical view, partly in section and partly in elevation, of the hanging device and the electric motor. Fig. 3 is a side view of the bracket carrying the lower bearing of the motor. Fig. 4 is a plan view of the motor, showing the spindle and hollow shaft in section.

At 1 is represented any fixed body, such as a girder or tank, from which is hung the combined centrifugal and driving-motor.

A base member 2 is bolted to the under side of the member 1, and to the base 2 is secured the hanger 3. This hanger 3 is hollow and at its bottom has a perforation for allowing the passage of the non-rotatable spindle 4 there-through. This perforation is slightly larger in diameter than the spindle 4 at this point to permit gyratory movement of the spindle without engagement with the hanger 3. In the lower end of the hanger 3 is a spherical cavity lined with a surfaced mass of metal *a*, on which bears the spherical member 5. This member 5 has cut in it a vertical slot *b*, which embraces an extension *c* on the interior of the member 3. Member 5 is secured to spindle 4 and in consequence of the extension *c* said spindle is incapable of rotation. Because of considerable play between the slot *b* and the extension *c* the spindle 4 and the member 5

may, however, deflect or gyrate in any direction. Upon spindle 4 is mounted the motor and centrifugal, and it is about the member 5, therefore, that any deflection of the centrifugal and motor takes place.

As resilient means for opposing the deflection of the spindle 4 there is supplied a mass of rubber or like material 6, embracing the spindle 4 and filling the upper end of the hanger 3. To adjust the resiliency of the member 6, it may be compressed to a greater or less extent between the washers 7 and 8. The lower washer 8 bears against a flange 9 on the spindle 4, and the upper washer 7 is held in any position desired by means of the washer 10 and set-screw 11.

The spindle 4 extends downwardly through the motor and just beyond the centrifugal basket 12, which revolves within the housing 13.

14 is a hollow shaft surrounding the spindle 4 and secured to the centrifugal basket 12 to drive the same. Mounted upon the upper portion of the shaft 14 is the armature-spider 15, carrying the armature 16. It is therefore by the armature 16 that the shaft 14 and the centrifugal basket 12 are driven.

The member 17 is secured at its lower extremity by screw-threads to the shaft 14, and within the member 17 is maintained a quantity of lubricating-oil, which passes down between the spindle 4 and the inner surface of the shaft 14 and is drawn off at the bottom of the centrifugal. This oil may be introduced through the opening 18, which embraces the hanger 3. The surface 19 of the member 17 is employed for mechanical braking, a brake-strap 20 being drawn against the surface 19 by the lever 21, controlled by the handle 22.

As seen in Fig. 2, the arrangement of the brake-wheel and lubricator is such that the armature of the motor is brought as close as may be to the hanger 3, thus economizing space and reducing the dimensions of the entire apparatus.

The motor herein shown is of the multipolar type, whose field-ring or yoke is shown at 23 and whose poles are shown at 24. Upon each pole is a shunt-winding 25 and a series winding 26. The field-ring 23 is secured in the bracket 27, extending upwardly and beyond the hanger 3. The upper extension of the spindle 4 enters the center of the bracket 27 and is keyed to said bracket to prevent any relative motion. 27^a is a cen-

tering-screw by means of which the field is properly adjusted with respect to the armature. From this structure it is apparent that the field-ring 23 is supported by bracket 27 and by means of said bracket 27 maintained always in the same relative position with respect to spindle 4 or the shaft 14, and there is therefore no relative motion between the field and armature of the motor. In case of a deflection of the centrifugal the spindle 4 swings slightly out of the vertical and in so doing carries the shaft 14, and therefore the armature 16, with it, and through the medium of the bracket 27 carries the field of the motor also, so that there may be no relative motion between the armature and the field. In other words, the motor swings as an entirety with the centrifugal about the member 5. As a further steadying means for the field portion of the motor I employ the bracket 28, which is secured at its upper end to the field-ring 23 and carries at its lower end the bearing 29, through which passes the shaft 14. This bracket is not indispensable. The brushes 30 of the motor are supported from the field-ring of the motor and bear upon the commutator 31 in the well-known manner.

From the foregoing description it is apparent that I have devised an electrical drive for centrifugals in which the greatest economy in space or head room has been effected and in which the field and armature of the motor occupy at all times the same relative position with respect to each other irrespective of the centrifugal or its deflection.

A hand-lever 64 is mounted upon the curb 13 and is adapted to communicate with the electric controller for the motor.

What I claim is—

1. In combination, a centrifugal basket, a support therefor, the rotatable element of a motor connected with said basket, means secured above said support for supporting the non-rotatable element of said motor in an unvarying position with respect to said rotatable element, and means for adjusting said fixed motor element with respect to its supporting means.

2. In combination, a centrifugal basket, a support therefor, a motor-armature connected with said basket, means secured above said support for supporting the field of said motor concentrically with respect to said armature, and means for adjusting said motor-field with respect to said armature.

3. The combination with a suspended centrifugal basket, of a motor directly connected with said basket, and means secured above the point of suspension for supporting the field of said motor in unvarying relation with respect to the motor-armature.

4. In combination, a support, a centrifugal basket and electric motor suspended therefrom, the rotatable motor element being di-

rectly connected with said centrifugal, means secured above said support for supporting the non-rotatable element of said motor in unvarying position with respect to the rotatable element of said motor, means for adjusting the non-rotatable motor element with respect to the rotatable motor element, and means permitting the deflection of the basket and motor.

5. The combination with a centrifugal basket, a rotatable motor element directly connected therewith, means for suspending said motor and basket, and means secured to said suspending means above its point of support for supporting the non-rotatable element of said motor in unvarying position with respect to the rotatable element of said motor.

6. The combination with a centrifugal basket, of a motor directly connected therewith, a spindle as means for suspending said basket and motor, and means secured to said spindle above its point of suspension for maintaining the non-rotatable and rotatable elements of said motor in unvarying relative position.

7. In an electrical drive for centrifugals, the combination of a centrifugal basket, a motor directly connected therewith, a hanger, a spindle supporting said basket and motor, and capable of motion with respect to said hanger, and means secured to said spindle above its point of suspension for maintaining the non-rotatable and rotatable elements of said motor in unvarying relation with respect to each other.

8. In an electrical drive, the combination of a spindle, a hollow shaft rotatable thereon, the rotatable element of a motor secured to said hollow shaft, means secured to said spindle above its point of suspension for supporting the non-rotatable element of said motor in unvarying position with respect to the rotatable element, and means permitting deflection of the spindle.

9. In combination, a centrifugal basket, a motor directly connected therewith, a hanger, a spindle supported by said hanger, means permitting the relative movement of said spindle and hanger, the basket and motor supported by said spindle, and means secured to said spindle above said hanger for supporting the non-rotatable element of said motor in unvarying relation with respect to the rotatable element of said motor.

10. In combination, a hanger, a spindle supported thereby and capable of motion relative thereto, a motor and centrifugal basket supported by said spindle, and means secured to said spindle above said hanger for supporting the non-rotatable element of said motor in unvarying relation with respect to the rotatable element of said motor.

11. In combination, a hanger, a spindle supported thereby and capable of movement

relative thereto, means to be driven and a driving-motor supported by said spindle, and means secured to said spindle above said hanger for maintaining the non-rotatable and rotatable elements of said motor in unvarying position with respect to each other.

12. In combination, a hanger, a spindle supported thereby and capable of movement relative thereto, means to be driven and a driving-motor supported by said spindle, and means secured to said spindle above said hanger for supporting the non-rotatable element of said motor in unvarying position with respect to the rotatable element of said motor.

13. In combination, a hanger, a spindle supported thereby and capable of movement relative thereto, a hollow shaft rotatable on said spindle, the rotatable element of a motor and a centrifugal basket secured to said shaft, and a bracket secured to said spindle above said hanger and supporting the non-rotatable element of said motor.

14. In combination, a hanger, a spindle supported thereby and capable of movement relative thereto, a hollow shaft rotatable on said spindle, a centrifugal basket and the rotatable element of a motor secured to said shaft, a bracket secured to said spindle above said hanger and supporting the non-rotatable element of said motor, and a bearing for said shaft secured to the non-rotatable element of the motor.

15. In a centrifugal suspension, a hanger, a spindle, a centrifugal basket supported thereby, an approximately spherical member secured to said spindle and engaging said hanger, a slot in said spherical member, and means secured to said hanger and engaging in said slot for preventing the rotation of said spherical member.

16. In a centrifugal suspension, a hanger, a spindle, a centrifugal basket supported thereby, an approximately spherical member secured to said spindle and engaging said

hanger, a slot in said spherical member, and means secured to said hanger and engaging loosely in said slot for preventing the rotation of said spherical member.

17. In combination, a hanger, a spindle, a centrifugal basket supported thereby, a spherical member secured to said spindle and bearing in a socket in said hanger, a slot in said spherical member, and means integral with said hanger engaging in said slot.

18. In combination, a hanger, a spindle, a centrifugal basket supported thereby, a spherical member secured to said spindle and bearing in a socket in said hanger, a slot in said spherical member, and means integral with said hanger engaging loosely in said slot.

19. In combination, a hanger, a spindle, a centrifugal basket supported thereby, a spherical member secured to said spindle and bearing in a socket in said hanger, a vertical slot in said spherical member, and means secured to said hanger and engaging loosely in said slot.

20. In combination, a hanger, a spindle, a centrifugal basket supported thereby, a spherical member secured to said spindle and bearing in a socket in said hanger, a vertical slot in said spherical member, means secured to said hanger and engaging loosely in said slot, and resilient means intermediate said hanger and spindle.

21. In combination, a hanger, a spindle, a centrifugal basket, suspended thereby, a spherical member secured to said spindle and bearing in a socket in said hanger, a vertical slot in said spherical member, an extension from said hanger engaging in said slot, resilient means intermediate said spindle and hanger, and means for adjusting the resiliency of said means.

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