Jan. 20, 1931. P. E. GELDHOF 1,789,940

DRIVE FOR CENTRIFUGAL EXTRACTORS

Filed Nov. 1, 1929 3 Sheets-Sheet 1

Fig- 1

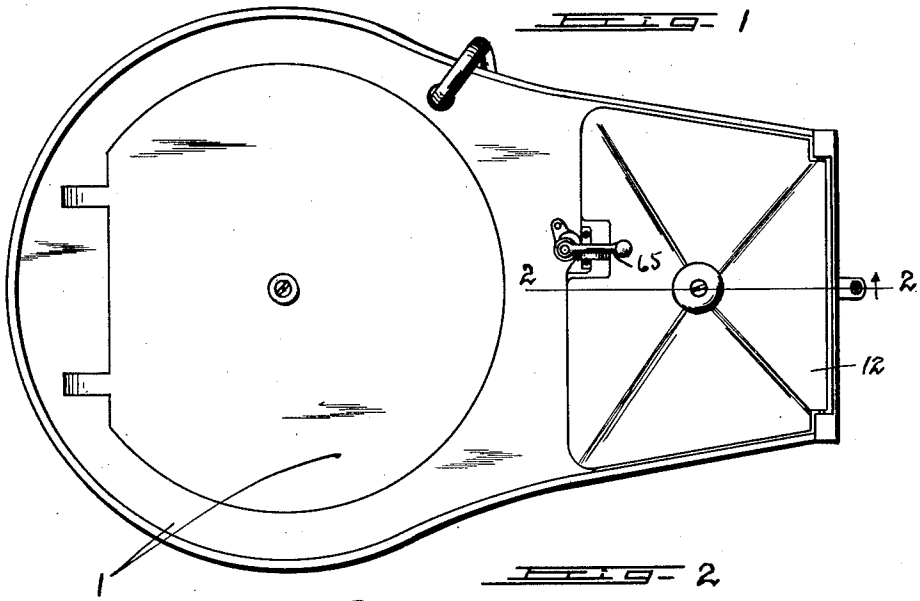
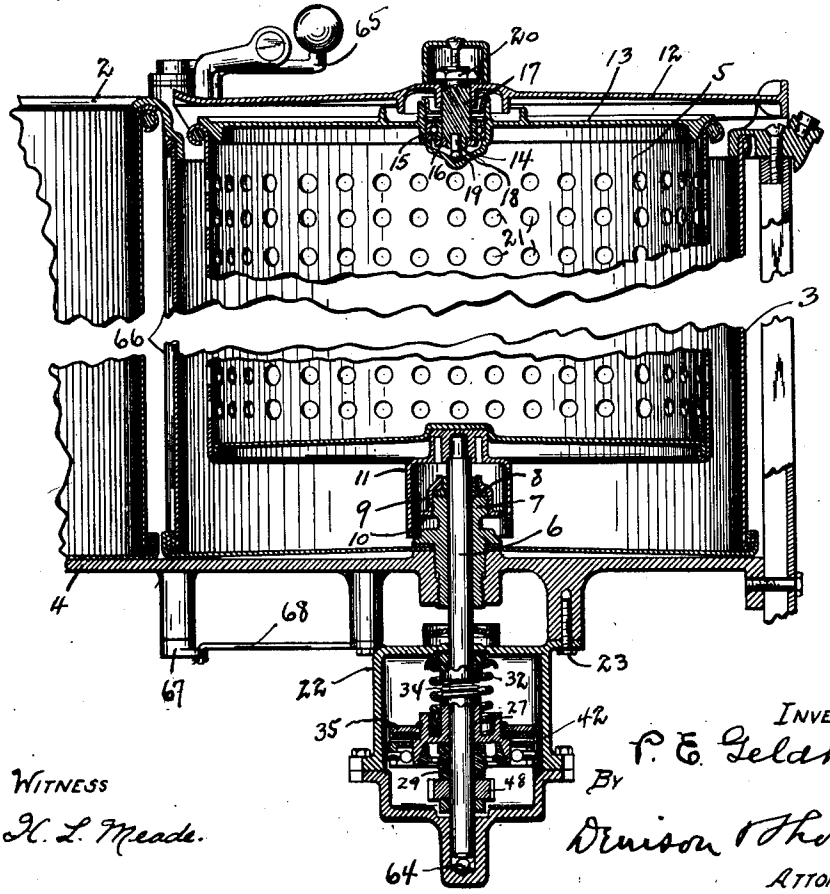


Fig- 2



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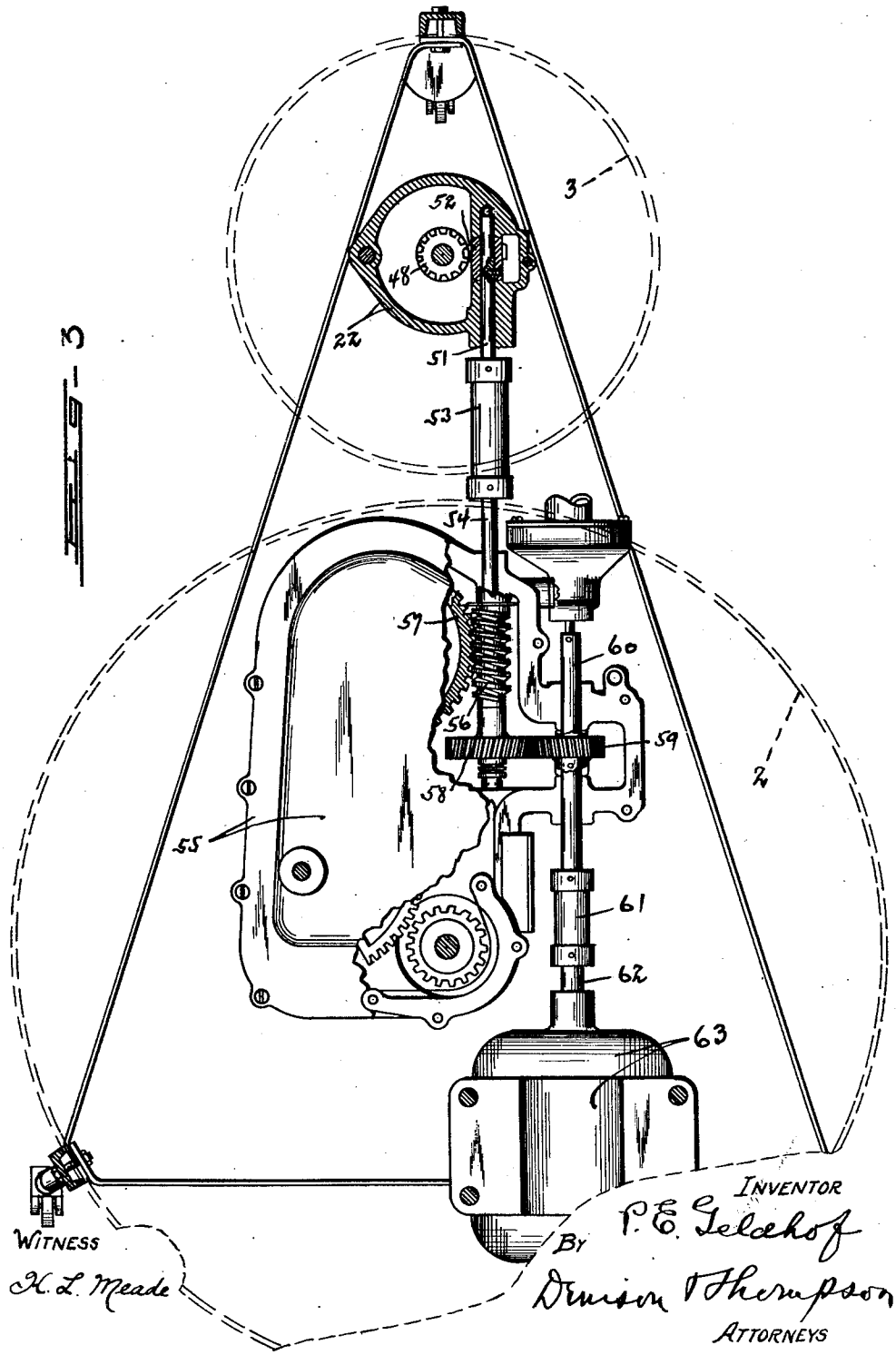


FIG. 3

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DRIVE FOR CENTRIFUGAL EXTRACTORS

Filed Nov. 1, 1929 3 Sheets-Sheet 3

Fig- 4

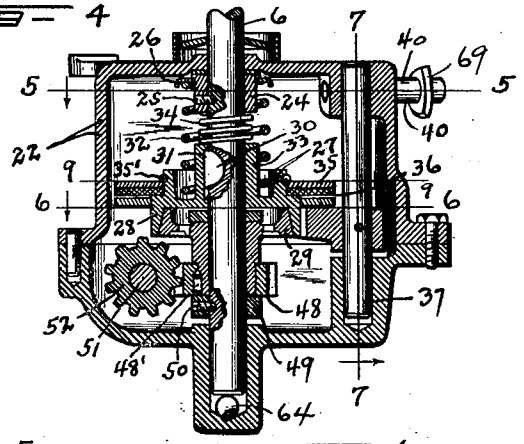


Fig- 5

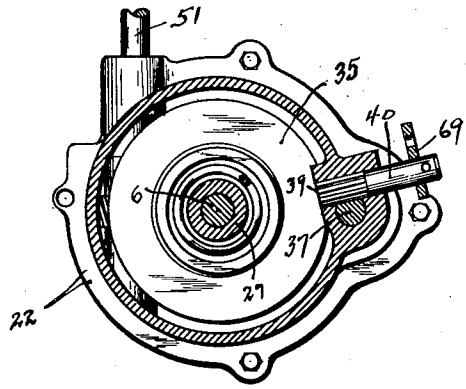


Fig- 6

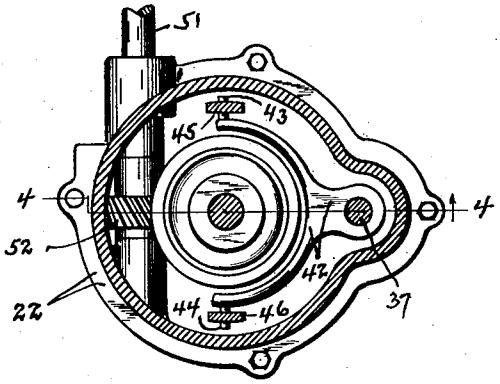


Fig- 7

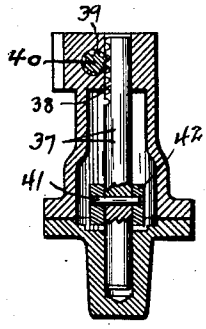


Fig- 8

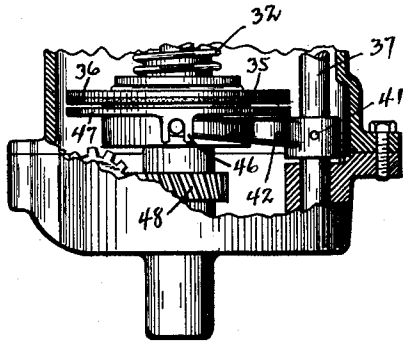
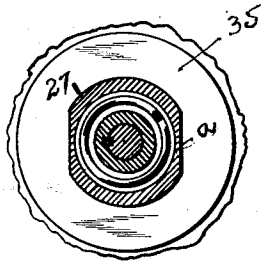


Fig- 9



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Patented Jan. 20, 1931 1,789,940

UNITED STATES PATENT OFFICE

PETER E. GELDHOF, OF SYRACUSE, NEW YORK, ASSIGNOR TO SYRACUSE WASHING MACHINE CORPORATION, OF SYRACUSE, NEW YORK, A CORPORATION OF DELAWARE

DRIVE FOR CENTRIFUGAL EXTRACTORS

Application filed November 1, 1929. Serial No. 404,082.

This invention relates to a new and improved drive for centrifugal extractors.

Although my invention may be used with any type of centrifugal extractor, it is particularly designed and is particularly well adapted for use with an extractor which is used in combination with a clothes washing machine.

Clothes washing machines of the so called household type are usually constructed with a combined washing mechanism and wringer or centrifugal extractor, which latter are used for the purpose of removing the water from the clothes after the washing operation has been performed. This type of apparatus is adapted to be used by a woman in her home and is so designed that it may be moved from place to place during use or for the purpose of storage when it is not in use. It is therefore necessary that machines of this type be so designed that they are comparatively light and compact, but at the same time, they must be of such a construction that their continued operation is insured without any necessity of adjustments or repairs by the individual using them.

The invention here disclosed is particularly directed to a driving means to be employed in operating a centrifugal extractor which is used in combination with a washing machine and the main object of my invention is to provide a driving mechanism for a centrifugal extractor which will be not only positive in action, compact and light in weight, but which at the same time may be conveniently manipulated by the user.

Another object is to provide a driving mechanism for a centrifugal extractor which is of such a simple and sturdy design that its continued operation during use will be assured.

Other objects and advantages relate to the size, shape and arrangement of parts all as will more fully appear from the following description taken in connection with the accompanying drawings in which:—

Figure 1 is a top plan view of a combined washing and drying machine embodying my invention.

Figure 2 is a section on line 2—2 of Figure 1.

Figure 3 is a top plan view, partially broken away and partially in section of the power plant and part of the transmitting mechanism used with my device.

Figure 4 is a section on line 4—4 of Figure 6.

Figure 5 is a section on line 5—5 of Figure 4.

Figure 6 is a section on line 6—6 of Figure 4.

Figure 7 is a section on line 7—7 of Figure 4.

Figure 8 is a side elevation, partly broken away and partially in section of the clutch and brake used with my device.

Figure 9 is a section on line 9—9 of Figure 4.

The washing and drying apparatus 1 here disclosed consists of a vat 2 in which is provided any desired type of washing mechanism, no particular type here being shown, inasmuch as my invention is directed particularly to the centrifugal extractor.

Adjacent vat 2 is provided a second vat 3, vats 2 and 3 being supported on frame 4 of the device. In vat 3, I provide a cylindrical basket 5 rotatably mounted in vat 3 on a shaft 6 which extends downwardly through the bottom of vat 6 and is journaled in a bearing 7 secured in the bottom of vat 6.

For the purpose of preventing any liquid extracted from the clothes entering between shaft 6 and bearing 7, I provide on the upper end of bearing 7, a packing gland 8 secured in place by a collar 9 which is in threaded engagement with the upper end of bearing 7. The lower end of collar 9 is provided with an annular flange 10.

On the bottom of basket 5, I provide a depending annular collar 11 which extends downwardly below flange 10 and in spaced relation thereto.

For the purpose of stabilizing the basket 5 during its rotary movement, I provide on the upper face of frame 4 a hinged cover 12.

On the under surface of cover 12, I provide a lid 13 rotatably mounted thereon and

adapted to engage the upper end of basket 5 when cover 12 is in the closed position.

In order that the lid 13 may be in proper frictional contact with the upper end of basket 5 so as to rotate therewith, I provide a bearing for lid 13 which comprises a centrally located cone shaped member 14 in which is positioned a ball bearing 15.

The inner race of bearing 15 is supported on an annular flange 16 carried by a depending shaft 17 secured in cover 12. A pin 18 extends downwardly from the lower end of shaft 17 and abuts against a ball 19 positioned in the lower end of the cone shaped member 14.

For the purpose of securing shaft 18 in the adjusted position, I provide a lock nut 20.

I have here shown basket 5 as being provided with a plurality of spaced apertures 21, but it will be understood that my device is also adapted to be used with an imperforate basket if it is desired.

Beneath vat 3, I provide a gear case 22 secured to the under surface of frame 4 as by screws 23. Shaft 6 extends downwardly into gear case 22 to a point adjacent the lower end thereof.

Adjacent the upper end of gear casing 22 and on the interior thereof, I provide a collar 24 secured to shaft 6 as by a set screw 25 and being provided at its upper end with an annular flange 26.

Beneath collar 25 and in spaced relation thereto, I provide on shaft 6 a slidably mounted female clutch member 27 having a depending annular flange 28 adapted to receive a male clutch member 29 which is rotatably mounted on shaft 6.

In shaft 6, I provide a key 30 slidably mounted in a slot 31 in clutch member 27.

A spiral spring 32 encircles collar 24 with its upper end abutting against annular flange 26 on collar 24 and has its lower end encircling a hub 33 on clutch member 27 with the lower end of spring 32 abutting against clutch member 27.

A second spiral spring 34 encircles shaft 6 and has its upper end abutting against collar 24 and its lower end abutting against the upper end of hub 33.

The sizes and tension of springs 32 and 34 are such that clutch member 27 is normally held downwardly in frictional contact with clutch member 29. On the upper end of clutch member 27, I provide an annular flange 35. Beneath flange 35 and encircling clutch member 27 is positioned a facing 36 such as brake lining for a purpose hereinafter to be described.

Annular flange 35 consists of a metallic ring having a central aperture with opposed flat sides as indicated at —*a*— on Figure 9, which aperture conforms to the shape of the upper end of clutch member 27 so that there can be no relative rotary movement of clutch member 27 and flange 35. Flange 35 is held in position on clutch member 27 by means of a circular spring 35′ seated in an annular groove in clutch member 27.

On one side of gear casing 22, I provide a vertically extending shaft 37 having one end slidably mounted in the upper end of gear casing 22 and having its lower end slidably mounted in the bottom part of gear casing 22.

The upper end of shaft 37 is provided with a plurality of rack teeth 38 in engagement with gear teeth 39 carried on the inner end of a transverse shaft 40 journaled in gear casing 22 so that the rotation of shaft 40 will cause shaft 37 to be moved upwardly and downwardly in gear casing 22.

On shaft 37 and secured thereto as by a pin 41, I provide a yoke 42 carrying opposed laterally extending pins 43 and 44 which are positioned in opposed depending jaws 45 and 46 carried on a circular member 47 which encircles the lower end of clutch member 27. Member 47 is in opposed relation to and normally out of contact with facing 36 on annular flange 35 carried on clutch member 27.

On the lower end of clutch member 29 and secured thereto as by a pin 48′, I provide a spiral gear 48. Clutch member 29 and spiral gear 48 have their lower ends abutting against a collar 49 secured to shaft 6 as by a set screw 50 to secure them against downward displacement.

In the lower end of gear casing 22 is journaled a transverse shaft 51 carrying a spiral gear 52 in mesh with spiral gear 48.

The outer end of shaft 51 is connected as by a coupling 53 to a shaft 54 which shaft 54 extends into a gear casing 55 and is provided with a worm 56 in mesh with a worm gear 57 through which motion is transmitted to the washing machine mechanism.

On the end of shaft 54 is provided a helical gear 58 in mesh with a second helical gear 59 carried on a shaft 60. Shaft 60 is connected by a coupling 61 to the armature shaft 62 of an electric motor 63 so that the operation of the motor 63 will through armature shaft 62, coupling 61, shaft 60, gears 59 and 58 and shaft 54, coupling 53, shaft 51 and gear 52, transmit motion to the gear 48.

For the purpose of taking the end thrust of shaft 6 during rotation thereof, I provide in the bottom of gear casing 22, a ball 64 against which the lower end of shaft abuts.

For the purpose of manipulating the yoke 42 for the purpose of dis-engaging and permitting the engagement of clutch members 27 and 29, I provide on the upper surface of container 3, a crank 65 connected to a vertical rock shaft 66 which is journaled in frame 4.

On the lower end of rock shaft 66, I provide a crank 67 which is connected by a link 68 to a crank 69 secured to the outer end of

shaft 40 so that when crank 65 is moved to rock shaft 66, shaft 40 through crank 67, link 68 and crank 69 will in turn be rocked to cause the raising and lowering of shaft 37 which carried yoke 42.

Operation

When the motor 63 is in operation and it is desired to extract moisture from clothes which have been washed in the vat 2, the clothes are transferred to the basket 5 and the cover 12 is moved to the closed position.

Crank 65 is then manipulated to lower yoke 42 so as to lower disk 47 out of contact with the facing 36 on disk 35. With the parts in this position, the clutch member 27 will be moved downwardly by springs 32 and 34 into frictional contact with clutch member 29.

Clutch member 29, being rotated through gear 48 and gear 52, the locking together of clutch members 27 and 28 will cause the rotation of shaft 6 due to the fact that clutch member 27 is keyed to shaft 6 by key 30.

When the moisture has been extracted from the clothes and it is desired to remove them from the basket 5, the crank 65 is manipulated to raise yoke 42 which will cause disk 47 to be moved upwardly into contact with facing 36 on flange 35 and this upward movement will cause clutch member 27 to be moved vertically out of contact with clutch member 29 thereby breaking the driving connection between gear 52 and shaft 6.

With the parts in these positions, the basket 5 is brought speedily to rest because of the fact that the facing 36 acts as a brake to bring flange 35 to rest on disk 47.

The cover 12 may then be raised to permit the clothes to be removed from the basket 5.

This operation may, of course, be repeated as often as desired.

It will be understood that although my invention has been described as being particularly adapted to use with a washing machine, it may be used with any type of centrifugal extractor.

It will also be understood that although I have shown and described a specific structure and shape and arrangement of parts, numerous modifications may be made without departing from the spirit of my invention, for I do not desire to restrict myself to exact size, shape or arrangement of parts which have here been described as an exemplification of an embodiment of my invention as various changes may be made within the scope of the appended claims.

I claim:

1. A driving mechanism for centrifugal driers comprising, a shaft, a clutch member slidably mounted on the shaft for rotary movement therewith, an opposed clutch member rotatably mounted on the shaft, a gear secured to the last named clutch member, a spring normally pressing the first named clutch member into frictional contact with the second named clutch member, means for imparting rotary motion to the gear, and means for holding the clutch members in spaced relation against the action of the spring, such means including a vertical shaft, rack teeth on one end of the shaft and a transverse rock shaft having gear teeth in mesh with the rack teeth on the vertical shaft.

2. A driving mechanism for centrifugal driers comprising, a shaft, a clutch member slidably mounted on the shaft for rotary movement therewith, an annular flange on such clutch member, an opposed clutch member rotatably mounted on the shaft, a gear secured to the last named clutch member, means for imparting rotary motion to the gear, a spring normally pressing the first named clutch member into frictional contact with the second named clutch member, a ring surrounding the first named clutch member and normally in spaced relation to the flange on such clutch member, and means for moving the ring vertically into contact with the flange whereby the clutch members are held in spaced relation against the action of the spring.

3. A driving mechanism for centrifugal driers comprising, a shaft, a clutch member slidably mounted on the shaft for rotary movement therewith, an anuular flange on such clutch member, an opposed clutch member rotatably mounted on the shaft, a gear secured to the last named clutch member, means for imparting rotary motion to the gear, a spring normally pressing the first named clutch member into frictional contact with the second named clutch member, a ring surrounding the first named clutch member and normally in spaced relation to the flange on such clutch member, and means for moving the ring vertically into contact with the flange whereby the clutch members are held in spaced relation against the action of the spring, such means including a yoke having one end pivotally connected to the ring and having the other end secured to a vertical shaft slidably mounted in the housing, rack teeth on one end of the vertical shaft, and a transverse rock shaft journaled in the housing and having teeth in mesh with the rack teeth.

4. A driving mechanism for centrifugal driers comprising a shaft, a clutch member slidably mounted on the shaft for rotary movement therewith, an annular flange on such clutch member, a friction facing on the underside of the annular flange, an opposed clutch member rotatably mounted on the shaft, a gear secured to the last named clutch member, means for imparting rotary motion to the gear, a spring normally pressing the first named clutch member into frictional contact with the second named clutch mem-

ber, a ring surrounding the first named clutch member and normally in spaced relation to the flange on such clutch member, and means for moving the ring vertically into contact with the facing on the flange whereby the clutch members are held in spaced relation against the action of the spring.

5. A driving mechanism for centrifugal driers comprising a shaft, a clutch member slidably mounted on the shaft for rotary movement therewith, an annular flange on such clutch member, a friction facing on the underside of the annular flange, an opposed clutch member rotatably mounted on the shaft, a gear secured to the last named clutch member, means for imparting rotary motion to the gear, a spring normally pressing the first named clutch member into frictional contact with the second named clutch member, a ring surrounding the first named clutch member and normally in spaced relation to the flange on such clutch member, and means for moving the ring vertically into contact with the facing on the flange whereby the clutch members are held in spaced relation against the action of the spring, such means including a yoke having one end connected to the ring and having the other end secured to a vertical shaft, rack teeth on one end of the vertical shaft, and a transverse rock shaft having teeth in mesh with rack teeth on the vertical shaft.

In witness whereof I have hereunto set my hand this 16th day of October, 1929.

PETER E. GELDHOF.