Jan. 23, 1951 L. P. HANSEN 2,539,017

DRIVING MECHANISM FOR AGITATORS

Filed Nov. 2, 1948

2 Sheets-Sheet 1

Fig. 1.

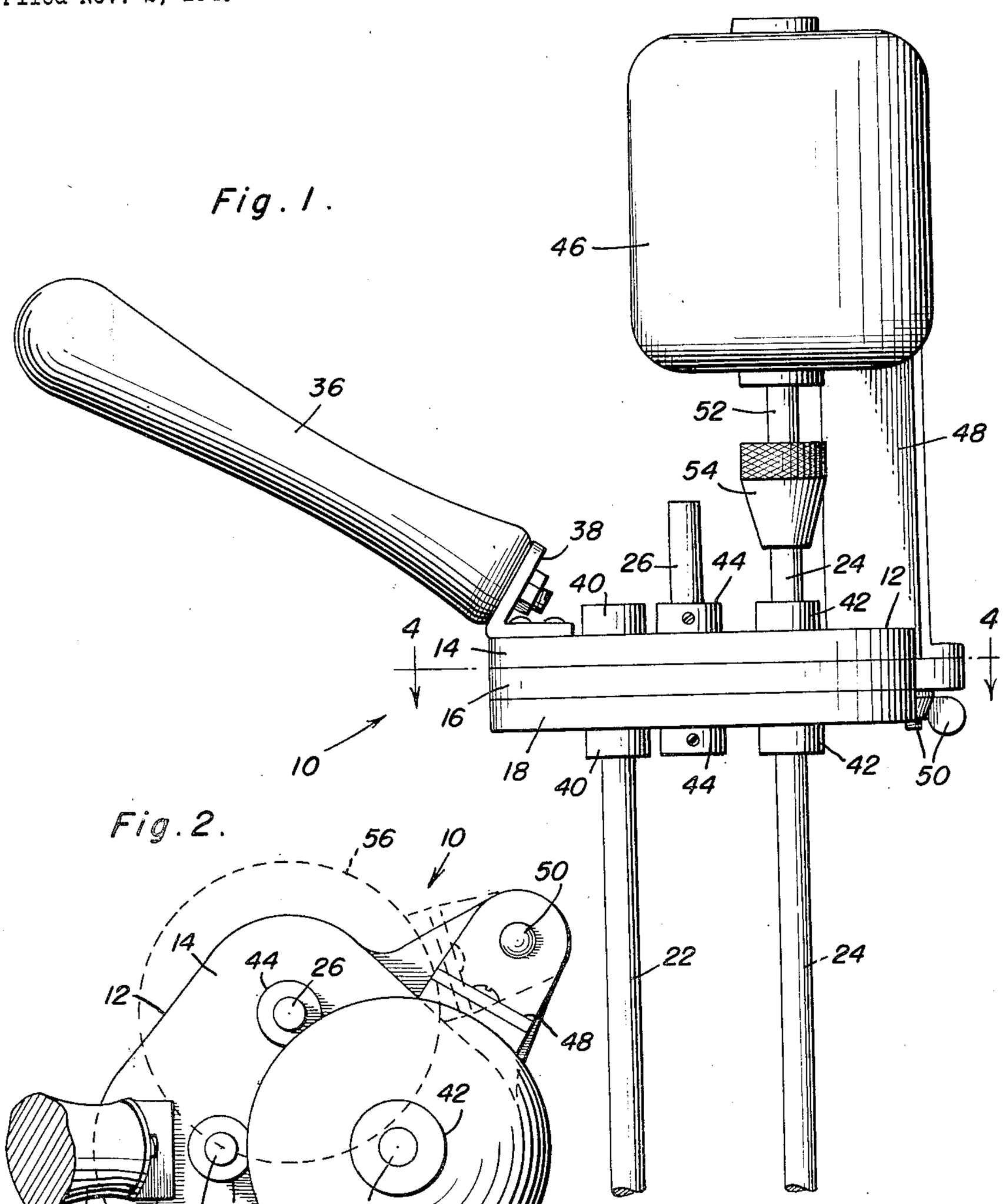

Fig. 2.

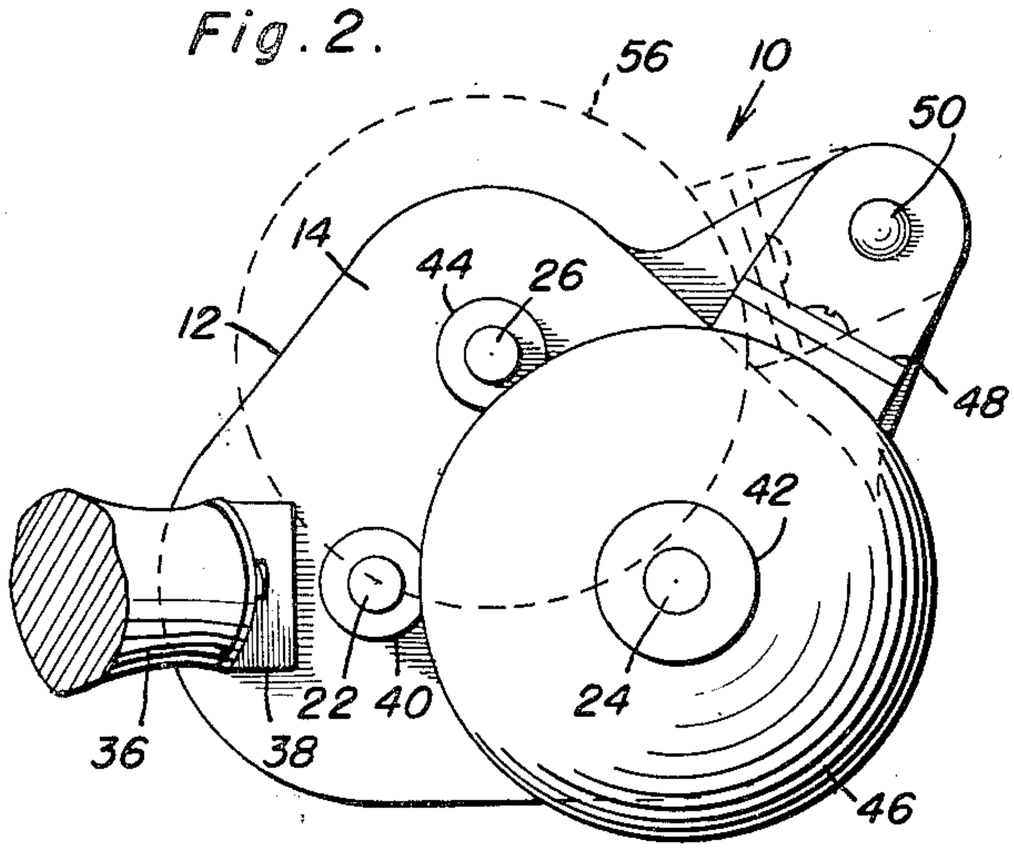

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Fig. 3.

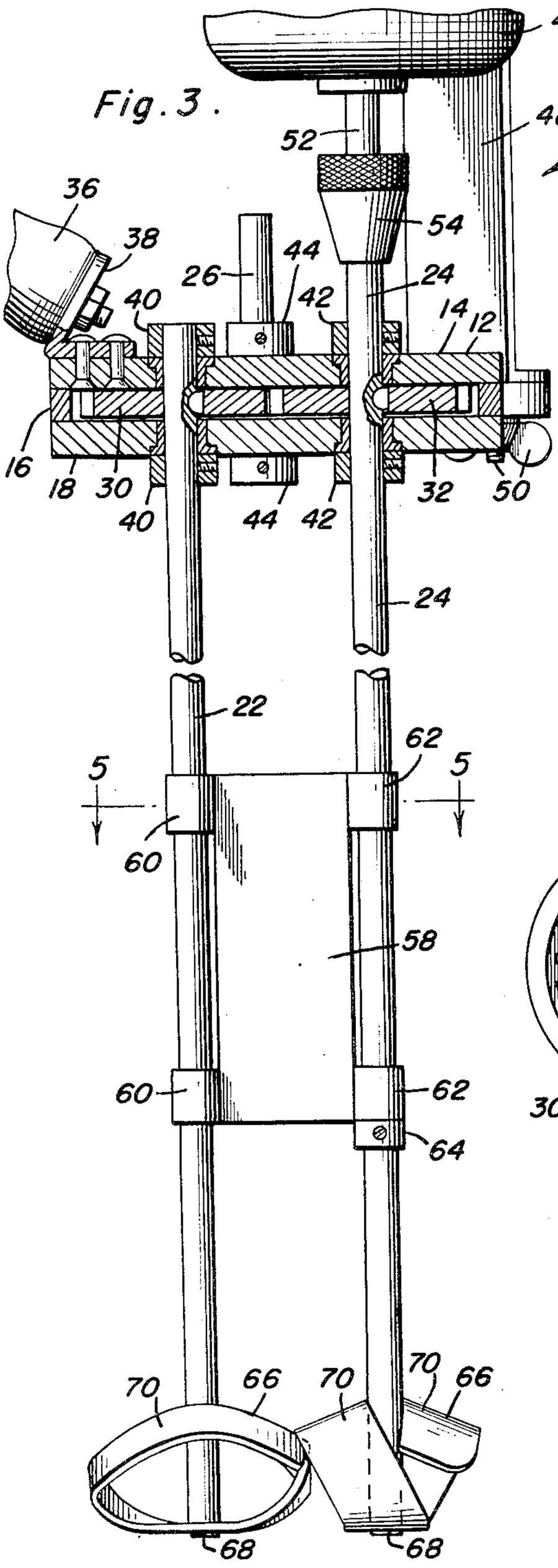


Fig. 5.

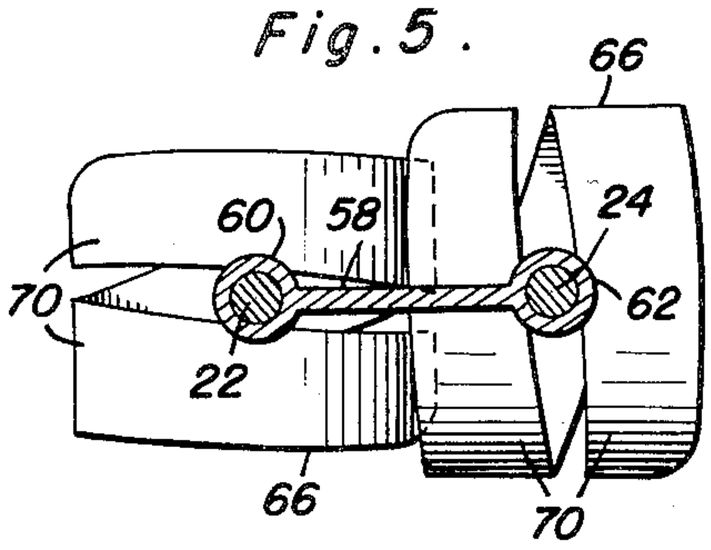
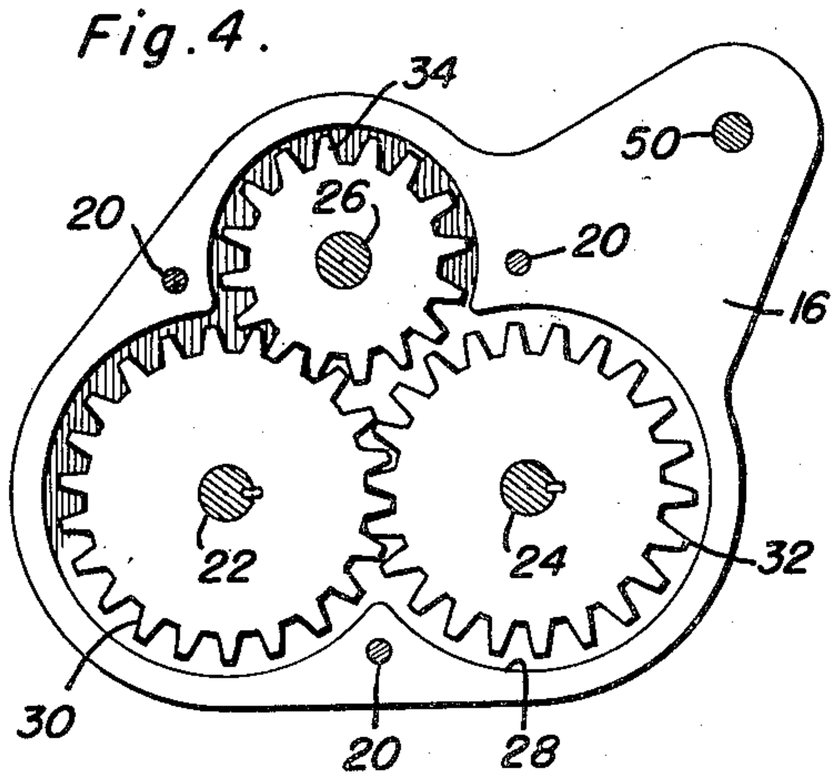


Fig. 4.



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DRIVING MECHANISM FOR AGITATORS

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Application November 2, 1948, Serial No. 57,891

3 Claims. (Cl. 74—16)

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This invention relates to new and useful improvements and structural refinements in mixing devices, and the principal object of the invention is to provide a portable mixing apparatus such as may be conveniently and efficiently employed for commercial mixing operations.

In particular, the invention contemplates the provision of a mixing apparatus including a gear head and a plurality of driven shafts extending therefrom, together with agitators on the driven shafts, and an important feature of the invention resides in the provision of means for driving the mixing apparatus selectively at two different speeds.

Another feature of the invention involves the provision of means for maintaining the driven shafts of the apparatus in spaced parallel relation, which feature is of considerable importance when the driven shafts are of substantial length and, in a portable device of this nature, do not have other means of support.

Some of the advantages of the invention reside in its simplicity of construction, convenience and efficiency of operation, and in its adaptability to economical manufacture.

With the above more important objects and features in view and such other objects and features as may become apparent as this specification proceeds, the invention consists essentially of the construction and arrangement of parts as shown in the accompanying drawings in which:

Figure 1 is a fragmentary side elevational view of the invention;

Figure 2 is a fragmentary top plan view thereof;

Figure 3 is a side elevational view, similar to that shown in Figure 1, but showing the invention partially in cross section so as to reveal its construction;

Figure 4 is a cross sectional view, taken substantially in the plane of the line 4—4 in Figure 1; and,

Figure 5 is a cross sectional view, taken substantially in the plane of the line 5—5 in Figure 3.

Like characters of reference are employed to designate like parts in the specification and throughout the several views.

Referring now to the accompanying drawings in detail, the invention consists of a mixing apparatus designated generally by the reference character 10, the same embodying in its construction a gear head 12 consisting of an upper plate 14, an intermediate plate 16 and a lower plate 18, these being secured together by suitable screws or the like, as indicated at 20 in Figure 4.

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The plates 14, 18 of the gear head 12 provide bearings for a pair of driven shafts 22, 24, and also, for a countershaft 26.

The intermediate plate 16 is recessed as indicated at 28 in Figure 4 so as to provide clearance for a set of gears 30, 32 and 34, these being keyed or otherwise secured to the respective shafts 22, 24 and 26 and the gears 30, 32 meshing together while the gear 34 is in mesh with the gear 30, substantially as shown in Figure 4.

It is to be noted that while the gears 30, 32 are equal in diameter and rotate at equal speeds, the gear 34 is relatively smaller and rotates at a greater speed than the gears 30, 32.

A suitable handle 36 may be secured by a bracket 38 to the upper plate 14 of the gear head 12, and while the driven shaft 22 extends downwardly and the countershaft 26 extends upwardly from the gear head, the shaft 24 extends downwardly as well as upwardly from the gear head, as best shown in Figures 1 and 3.

Suitable collars 40, 42 and 44 may be provided on the respective shafts 22, 24, 26 to prevent the shafts from sliding axially through the gear head, as will be clearly apparent.

A suitable electric motor 46 is mounted upon a bracket 48 which, in turn, is adjustably attached to the intermediate plate 16 of the gear head 12 by means of a suitable bolt and wing nut assembly 50, the armature shaft 52 of the motor 46 being equipped with a chuck 54 of a conventional type, which may be connected selectively to the upwardly projecting end portions of the shafts 24 and 26. That is to say, the distance from the center of the bolt 50 to the axis of the shaft 24 is the same as the distance from the center of that bolt to the axis of the shaft 26, so that by simply loosening the bolt and wing nut assembly 50, the bracket 48 may be swung on the gear head 12 so that the chuck 54 may be connected to the shaft 24 as shown by the full lines in Figure 2, or alternatively, the chuck may be connected to the shaft 26, in which event the motor 47 assumes the position illustrated by the phantom line 56.

It will be apparent from the foregoing that when the armature shaft 52 of the motor 46 is connected by means of the chuck 54 to the driven shaft 24, the shafts 22, 24 will be rotated at a certain speed, but on the other hand, when the chuck 54 is connected to the countershaft 26, the shafts 22, 24 will be rotated at a relatively slower speed by virtue of the gearing 34, 30 and 32. As a result, what may be called a two speed drive is provided between the armature shaft

of the motor and the shafts **24**, **26**, as the case may be.

The shafts **22**, **24** extend downwardly for a considerable length from the gear box or gear head **12**, and since they are disposed in spaced parallel relation, certain means may be utilized for retaining the two shafts in that relation, such as for example, a combined bearing block and spacer **58** (see Figure 3). This element simply assumes the form of a plate provided with bearing portions **60**, **62** to rotatably receive the respective shafts **22**, **24**, whereby the shafts are retained in their spaced parallel relation, as aforesaid. A suitable collar **64** may be positioned on one of the shafts so as to prevent the member **58** from sliding downwardly, as will be clearly apparent.

Each of the shafts **22**, **24** carries at its lower end an agitator **66**, this agitator simply consisting of a strip of material which has its midportion secured in any suitable manner to the end surface of the agitator shaft as at **68**, while the remaining portions of the strip are longitudinally twisted in relatively opposite direction and are arcuated so as to extend to the opposite sides of the agitator shaft, as indicated at **70**. By virtue of this arrangement the strip from which the agitator is formed constitutes a substantial helix, so to speak, having the axis thereof disposed at right angles to the shaft by which it is supported. It is to be noted that the two agitators on the shafts **22**, **24** are disposed at right angles, as illustrated in Figure 5.

It is believed that the advantages and use of the invention will be clearly apparent from the foregoing disclosure and accordingly, further description thereof at this point is deemed unnecessary.

While in the foregoing there has been shown and described the preferred embodiment of this invention it is to be understood that minor changes in the details of construction, combination and arrangement of parts may be resorted to without departing from the spirit and scope of the invention as claimed.

Having described the invention, what is claimed as new is:

1. In a driving mechanism, the combination of a gear head, driven shafts extending from said gear head and rotatable at equal speeds, a countershaft provided in said gear head and operatively connected to said driven shafts for rotation at a different speed relative thereto, a motor mounted on said gear head and including a drive shaft, and means for connecting said drive shaft selectively to one of said driven shafts and to said countershaft, said means including a bracket supporting said motor, and a fastening element attaching said bracket to said gear head at a point equidistant from one of said drive shafts and said countershaft.

2. The device as defined in claim 1 together with a chuck provided on said drive shaft, said chuck being connectable selectively to one of said drive shafts and said countershaft.

3. In a driving mechanism of the type described, the combination of a gear case, a plurality of spaced parallel driven shafts rotatably journaled therein and projecting outwardly therefrom, meshing gears of equal diameters provided in said case on said driven shafts whereby the latter are rotatable at equal speeds, a countershaft rotatable in said gear case and projecting outwardly therefrom, an additional gear secured to said countershaft and meshing with one of the gears on said driven shafts, the gear on said countershaft being of a different diameter than the gears on the driven shafts whereby the driven shafts and the countershaft are rotatable at different speeds, a fastening element provided on said case at a point equidistant from said countershaft and one of said driven shafts, a bracket adjustably attached to said case by said element, a motor mounted on said bracket and including a drive shaft, and a coupling on said drive shaft for connecting the latter selectively to said countershaft and to one of said driven shafts.

LESTER P. HANSEN.

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