A. V. ALLEN.

GEARING.

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903,653.

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Fig. 1.

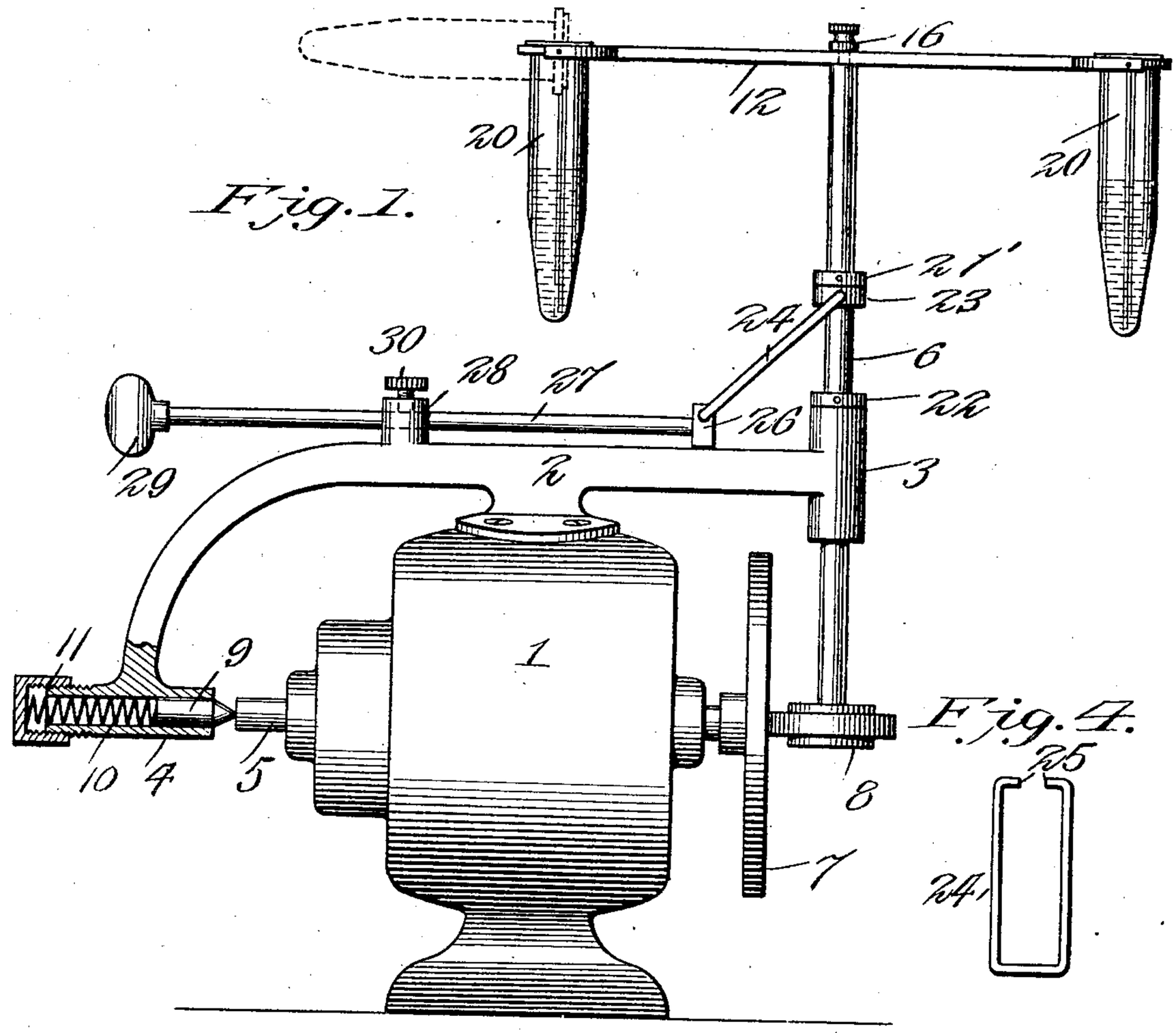



Fig. 4.

Fig. 2.

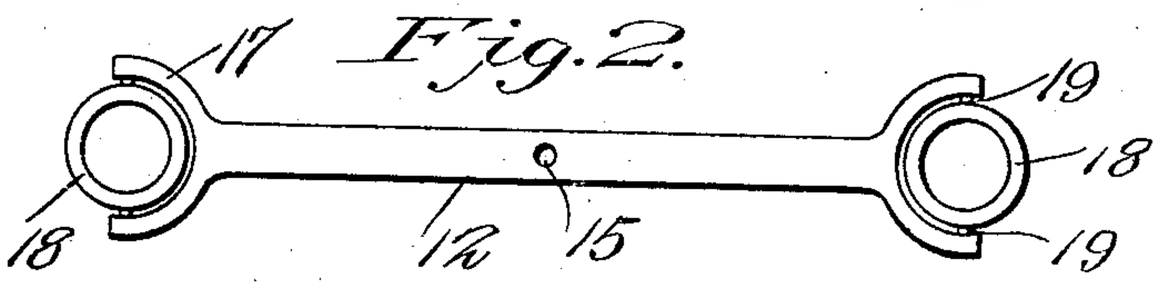



Fig. 5.

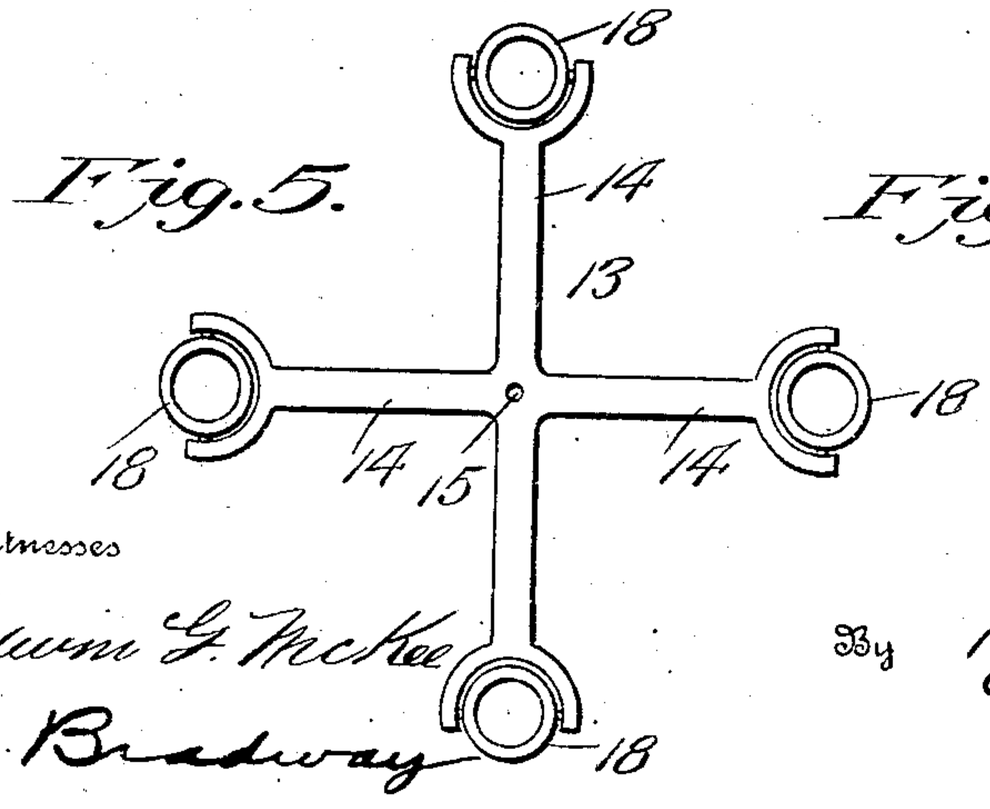
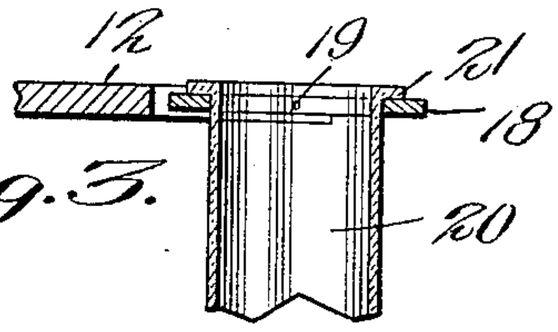



Fig. 3.

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# UNITED STATES PATENT OFFICE.

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## GEARING.

No. 903,653. Specification of Letters Patent. Patented Nov. 10, 1908.

Application filed April 6, 1907. Serial No. 366,806.

*To all whom it may concern:*

Be it known that I, ARTHUR V. ALLEN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Gearing, of which the following is a specification.

This invention relates to electric centrifuges or devices for the sedimentation of liquids, such as water, milk, blood, sputum, etc.

The invention has for one of its objects to improve and simplify the construction and operation of an apparatus of this character so as to be comparatively easy and inexpensive to construct, readily manipulated for obtaining large variation of speed and highly efficient and reliable in use.

A further object of the invention is the provision of a device adapted to be driven by a constant speed electric motor, said device having a speed changing means whereby any desired number of revolutions may be obtained according to the character of the liquid to be subjected to a sedimentation operation. In this connection it may be remarked that it is the usual practice to employ a motor of special design or a speed controller whereby variation of speed may be obtained and as a motor of special design or a speed controller is expensive, the apparatus as a whole is of comparatively great cost. It is, therefore, one of the objects of the present invention to obviate the use of these costly devices by the provision of a constant speed motor equipped with means for obtaining any desired speed of rotation of the element carrying liquid containing vessels.

Another object of the invention is the employment of a mechanism in the nature of an attachment for motors including a speed changing device disposed between the shafts of the motor and vessel support.

A still further object is the employment of a change speed gear of the friction type, with means operating on the motor shaft for holding the members of the friction gear in operative position.

With these and other objects in view, as will appear as the description proceeds, the invention comprises the various novel features of construction and arrangement of parts, which will be more fully described hereinafter and set forth with particularity in the appended claims.

In the accompanying drawing which illustrates one of the embodiments of the invention:—Figure 1 is a front elevation of the apparatus. Fig. 2 is a plan view of one form of test tube or other vessel support. Fig. 3 is an enlarged detail sectional view of one end of the test tube support. Fig. 4 is a detailed view of the link member included in the speed changing device. Fig. 5 is a plan view of a modified form of test tube support.

Referring to the drawing, 1 designates a motor of standard construction of the direct or alternating current type and mounted thereon is a bracket 2 that is formed at one end with a vertical bearing 3, and at the opposite end with a head 4 disposed at one end of the motor shaft 5 and in alinement therewith. The bracket which is detachably supported on the motor, carries a vertically extending shaft 6 that passes through the cylindrical bearing 3, said shaft being disposed at right angles to the motor shaft. On the motor shaft is a friction disk 7 with which coöperates a leather faced disk 8, secured to the lower end of the shaft 6. In the head 4 is mounted a pointed center member 9 that engages the end of the shaft 5 for urging the latter longitudinally to hold the disk 7 in frictional engagement with the disk or wheel 8, the said member 9 being pressed by a helical spring 10 housed in the head 4 and adjusted by means of a nut 11, on the head.

On the vertical shaft 6 is a test tube support 12 that may be in the form of a straight bar, as shown in Figs. 1 and 2, or in the form of a spider 13 having a plurality of radial arms 14, as shown in Fig. 5. The center of the test tube support has an opening 15 for the reception of a clamping screw 16, whereby the support is firmly secured to the shaft 6 to rotate therewith. The extremities of the support are bifurcated at 17 and between each pair of bifurcations is a ring or annular holder 18 pivoted on horizontally disposed pintles 19. These holders 18 receive the test tubes or other suitable vessels 20 that are each provided with a rim 21 by which the tubes are held in their respective holders or rings 18. The shaft 16 is provided with spaced collars 21′ and 22 that

may be adjustable and the lower one is adapted to engage the upper end of the bearing 3 when the shaft 6 is in its lowermost or inoperative position. Disposed between the collars 21′ and 22 is a third collar 23 that is connected by a U-shaped wire link 24 of the controller. The link 24 has its ends 25 turned inwardly to engage in diametrical openings in the collar 23. The lower end of the link 24 is hinged in a head 26 of a controller rod 27 that is adjustable longitudinally in a bearing 28, arranged on the bracket 2 in such a position that the controller rod is disposed above the bracket and is movable back and forth thereon. The outer end of the controller rod is provided with a grip 29 and to hold the controller in adjusted position, a clamping screw 30 is arranged in the bearing 28 for tightly engaging the rod 27.

In practice, the several test tubes are supplied with the proper quantity of liquid to be treated and suitable closures may be placed on their open ends. While the parts are in position as shown in Fig. 1, the motor is started in the usual manner and as long as the disk or wheel 8 is at the center of the disk 7, the shaft 6 will remain idle. The controller rod is then gradually moved inwardly to throw the friction disk 8 outwardly from the center of the disk 7 so as to impart rotation to the shaft 6. This movement is continued gradually until the desired speed of rotation is reached. During the acceleration of the shaft 6, the test tubes will change from a depending position to the dotted line position shown in Fig. 1, so that the full centrifugal force will act on the liquid in the test tubes and cause the solid matter to be thrown outwardly to the bottom of each test tube. After the operation is completed, the clamping screw 30 which has during the normal operation of the machine been tightened to hold the parts in fixed position, is unscrewed so that the rod 27 can be drawn outwardly to gradually bring the shaft 6 to rest, whereupon the test tubes gradually change to a depending position with the solid matter collected in the bottom of the tubes.

From the foregoing description, taken in connection with the accompanying drawing, the advantages of the construction and method of operation will be readily apparent to those skilled in the art to which the invention appertains and while I have described the principle of operation of the invention together with the device shown is merely illustrative and that such changes may be made when desired as are within the scope of the claims.

What I claim, is:—

1. The combination of a motor including a field frame and motor shaft, with an attachment removably mounted thereon, said attachment comprising a frame supported directly on the motor frame, a longitudinally movable shaft carried by the frame and disposed at right angles to the shaft of the motor, means for shifting the said movable shaft, a friction gearing between the shafts, and a device carried by the attachment frame and arranged to directly engage the motor shaft to hold the elements of the friction gearing in engagement.

2. The combination of a motor, with an attachment comprising a supporting structure removably mounted on the motor frame, a shaft supported on the frame and movable longitudinally, a friction gearing between the said shaft and motor, a shifting device including a longitudinally-movable rod mounted on the supporting structure for adjusting the longitudinally movable shaft, and means engaging the rod for clamping the device in set position.

3. The combination of a motor and motor shaft, with an attachment therefor comprising a support mounted entirely on the motor and having a portion disposed over one end of the motor shaft and provided with a bearing thereat, a spring-pressed element mounted in the bearing for longitudinal movement and arranged to directly engage the motor shaft to move the latter longitudinally, a longitudinally-movable shaft on the support, a friction disk on the end of the motor shaft opposite from that engaged by the said element, a friction wheel on the said longitudinally-movable shaft arranged to engage the friction disk, a rod slidably mounted on the support and disposed at right angles to the wheel-carrying shaft, a link connected with the rod, and a collar on the wheel-carrying shaft and connected with the link for shifting the said shaft.

4. In an attachment of the class described, the combination of a support, a bearing, a shaft adjustable longitudinally in the bearing, means for driving the shaft, a pair of spaced collars on the shaft, the lowermost collar being rotatably mounted on the said bearing, a loose collar disposed between the first-mentioned collars, and means connected with the loose collar for adjusting the shaft longitudinally.

5. The combination of a motor, a frictional disk driven thereby, a stationary support, a shaft mounted on the support, a frictional disk on the shaft, means on the shaft for holding the latter with the disk thereof at the center of the first mentioned disk, and means for actuating the shaft longitudinally to move its disk across the first mentioned disk.

6. The combination of a motor including a shaft, a disk thereon, a vertically disposed shaft, a bearing for the shaft, a disk on the vertical shaft arranged with its periphery in engagement with the first-mentioned disk,

a collar on the vertical shaft arranged to engage the bearing and hold the second disk at the center of the other disk, and means for adjusting the vertical shaft for shifting the second disk with respect to the other disk.

7. An attachment for motors comprising a support having hollow portions forming passages disposed at right angles to each other, a rotatable shaft in one passage, a yielding element in the other passage, means for rotating the shaft, and means on the support for adjusting the shaft longitudinally.

8. The combination of support, a bearing therein, a shaft rotatable in the bearing and adjustable longitudinally therein, spaced collars on the shaft, a loose collar disposed between the first-mentioned collars, a longitudinally-movable rod on the support disposed transversely to the shaft, a link hingedly connected to one end of the rod and hingedly connected with the collar, and a clamping device for holding the rod stationary.

In testimony whereof, I affix my signature in presence of two witnesses.

ARTHUR V. ALLEN.

Witnesses:
W. V. HENCE,
E. R. BEHREND.