May 21, 1929. F. W. OTT 1,713,549

POWER MECHANISM

Filed May 18, 1928

Fig. 1.

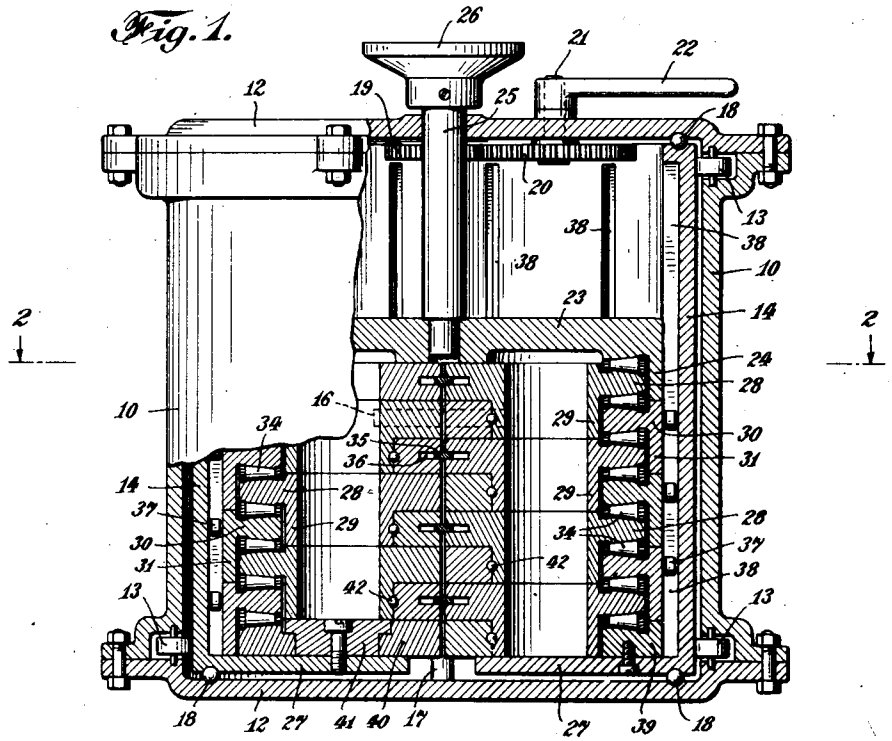


Fig. 2.

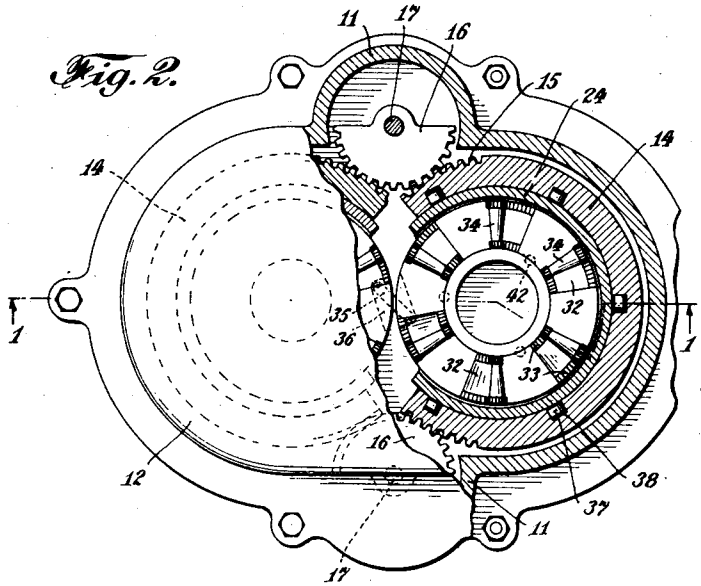
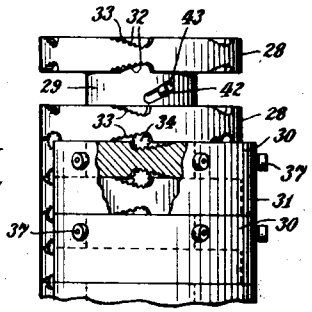


Fig. 3.



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POWER MECHANISM.

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This invention relates to new and improved power mechanism, and it is the object thereof, among other things, to produce mechanism of this character that may provide the maximum power pressure with the minimum manual effort.

To these and other ends, my invention consists in the power mechanism, having certain details of construction and combinations of parts, as will be hereinafter described and more particularly pointed out in the claims.

Referring to the drawings, in which like numerals of reference indicate like parts in the several figures;

Figure 1 is a fragmentary elevation of my improved power mechanism, the parts in section being taken generally upon line 1—1 of Figure 2;

Figure 2 is a fragmentary plan view thereof, the parts in section being taken generally upon line 2—2 of Figure 1; and

Figure 3 is a detail view of the plane rings when nested the topmost ring, however, being shown in its partly assembled position.

In the embodiment of my invention as disclosed herein, 10 is the casing having offset portions 11 upon opposite sides thereof and closed at its ends by cover plates 12, between which is a plurality of friction rolls 13.

Within the casing 10 are the sector shells 14, having a plurality of teeth 15, in their outer walls, into which mesh the teeth of the sectors 16, which are fixed on shafts 17 journaled in the cover plates 12. The rolls 13 provide lateral support for these sector shells without friction during rotation thereof which is also facilitated by the ball bearings 18.

Fixed on the shaft 17 is a pinion 19, the teeth of which mesh into those of a pinion 20, fixed on a shaft 21 journaled in one of the cover plates 12. This latter shaft being manually rotated by a wrench 22, which may permanently associated therewith or separately, as desired.

That portion of the shaft 21 outside of the cover plate 12 may be square or hexagonal in cross section to receive the socket of the wrench, but a standard form of ratchet wrench may be substituted, if desired.

Within the casing is a cap plate 23, having a downwardly depending flange 24 adjacent to its outer edge, and connected therewith is a rod 25 that projects through one of the cover plates 12, with a contact plate 26 fixed thereto.

Nested between the cap plate 23 and the shelf 27, integral with the sector shells 14, are two sets of plane rings, each set being composed of several rings, all rotating about a common axis, and the rings in both sets being substantially alike, although staggered in relation to each other.

There are two forms of such rings, one form, designated 28, having a flange 29 adjacent to the bore of the ring, and the other form designated 30, having the flange 31 at the outer edge of the ring. In either case these rings are so nested that the flange of one ring overlaps the body portion of the adjacent ring.

The top and bottom faces of each of these rings, as well as the inner face of the cap plate 23, are each provided with a plurality of angular planes 32, which are provided with teeth 33 at their inner and outer edges. The planes of one ring are so arranged that they are opposite the planes of the other ring and project in opposite directions, as illustrated in Figure 3.

Between each of these opposite planes is a toothed conical roll 34, the teeth of which mesh into the teeth 33 of the inclined planes. The arrangement of these rings in the sets is such that a ring 28 in one set is in the same plane as a ring 30 of the opposite set and have an operative connection with each other through a link 35 pivotally connected to these rings and projecting into a recess 36 in each ring.

Mounted upon and projecting outwardly from each of the rings 30 are a plurality of rolls 37, which project into recesses 38 in the inner wall of the sector shell 14.

Fixed to the shelf 27 of one of the sector shells 14 is a ring 39, which forms a base for the plane rings nested thereabove, and to the shelf 27 of the opposite sector shell 14 a similar ring 40 rotatably mounted about a block 41 fixed to said shelf.

Rotation of the shaft 21 imparts movement to the shaft 17, and sector 16 to sector shells 14, and through the latter and the rolls 37 to the plane rings 30. As the plane rings 30 in one set of rings are connected with the plane rings 28 of the opposite set through the links 35, positive motion is thus transmitted to each ring.

The rings 28 and 30 rotate in opposite directions and as the conical rolls 34 rotate about their axes through their toothed engagement with the inclined planes, the plane

rings are forced apart, thus causing the cap plate 23 to travel toward the adjacent cover plate 12 and the contact plate 26 away therefrom. Each ring is thus forced a limited distance away from the adjacent ring but in the aggregate the distance traveled by the cap plate 23 and contact plate 26 is proportionately greater. Thus, with the application of comparatively limited manual power to the shaft 21 a great pressure may be applied by the contact plate 26 to any object against which it may be placed.

To prevent the disengagement of the rolls when in their extended positions, each ring is associated with the adjacent ring through a plurality of balls 42, which travel in an inclined slot 43 in the adjacent wall of each ring, by which means the rings are permitted to move apart to the maximum distance and still retain the conical rolls therebetween.

There are minor changes and alterations that may be made within my invention, and I would therefore have it understood that I do not limit myself to the exact construction herein shown and described, but claim all that falls fairly within the spirit and scope of the appended claims.

Having described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In mechanism of the character described; a plurality of rotary inclined planes, said inclined planes being arranged in a plurality of series of inclined planes and each of the planes in each series having a common axis; rolls therebetween and manual means for rotating said planes whereby through the movement of the rolls on said planes the planes are moved toward and away from each other.

2. In mechanism of the character described; a plurality of rings having a common axis and each ring having one or more inclined planes thereon; rolls between the rings that contact with the inclined planes; and means for rotating the rings whereby the rolls will move about their axes and the rings toward and away from each other, each of said rolls having an intermeshing engagement with two inclined planes.

3. In mechanism of the character described; a plurality of rings having a common axis and each ring having one or more inclined planes thereon; rolls between the rings that contact with the inclined planes, each of the rings having a flange and the inclined planes thereon terminating at one end adjacent to the flange; and means for rotating the rings whereby the rolls will move about their axes and the rings toward and away from each other.

4. In mechanism of the character described; a plurality of rings having a common axis and each ring having one or more inclined planes thereon; rolls between the rings that contact with the inclined planes, each of the rings having a flange and the inclined planes thereon terminating at one end adjacent to the flange; and means for rotating the rings whereby the rolls will move about their axis and the rings toward and away from each other, the said flanges being so arranged that some rings have the flange upon the outer edge thereof and others have the flange upon the inner edge thereof.

5. In mechanism of the character described; an enclosing element; a plurality of sector shells within the enclosing element; a plurality of plane rings in each sector shell, each ring having one or more inclined planes thereon; means for operatively connecting some of the rings in one of the sector shells with some of the rings in the other sector shell; a member extending over all of said rings; a rod connected with the member and projecting outside of the enclosing element; rolls between the inclined planes of the rings; and means for manually moving the sector shells and thereby imparting rotation to the rings and through the rolls axial movement to the rod.

6. In mechanism of the character described; an enclosing element; a plurality of sector shells within the enclosing element; a plurality of plane rings in each sector shell, each ring having one or more inclined planes thereon; means for operatively connecting some of the rings in one of the sector shells with some of the rings in the other sector shell; a member extending over all of said rings; a rod connected with the member and projecting outside of the enclosing element; rolls between the inclined planes of the rings; and means for manually moving the sector shells and thereby imparting rotation to the rings and through the rolls axial movement to the rod, some of said rings having an operative engagement with the adjacent sector shell that prevent relative rotation of the ring but permit axial movement thereof.

7. In mechanism of the character described; an enclosing element; a plurality of sector shells within the enclosing element; a plurality of plane rings in each sector shell, each ring having one or more inclined planes thereon; means for operatively connecting some of the rings in one of the sector shells with some of the rings in the other sector shell; a member extending over all of said rings; a rod connected with the member and projecting outside of the enclosing element; rolls between the inclined planes of the rings; and means for manually moving the sector shells and thereby imparting rotation to the rings and through the rolls axial movement to the rod, a ring in one of the plurality of rings being fixed to one of the sector shells and another ring in substantially the same plane as the last mentioned ring being rotatably mounted on a sector shell.

8. In mechanism of the character described; an enclosing element; a plurality of sector shells within the enclosing element; a plurality of plane rings in each sector shell, each ring having one or more inclined planes thereon; means for operatively connecting some of the rings in one of the sector shells with some of the rings in the other sector shell; a member extending over all of said rings; a rod connected with the member and projecting outside of the enclosing element; rolls between the inclined planes of the rings; means for manually moving the sector shells and thereby imparting rotation to the rings and through the rolls axial movement to the rod, said sector shells having a toothed engagement with each other through an intermediate member; and means for manually actuating the intermediate member.

9. In mechanism of the character described; an enclosing element; a plurality of sector shells within the enclosing element; a plurality of plane rings in each sector shell, each ring having one or more inclined planes thereon; means for operatively connecting some of the rings in one of the sector shells with some of the rings in the other sector shell; a member extending over all of said rings; a rod connected with the member and projecting outside of the enclosing element; rolls between the inclined planes of the rings; means for manually moving the sector shells and thereby imparting rotation to the rings and through the rolls axial movement to the rod; and means for limiting the relative outward movement of the rings to prevent the separation of the rolls therefrom.

In testimony whereof, I have hereunto affixed my signature.

FRED W. OTT.