M. J. FLYNN.

PULL SOCKET.

APPLICATION FILED JUNE 26, 1908.

921,969. Patented May 18, 1909.

Fig. 1.

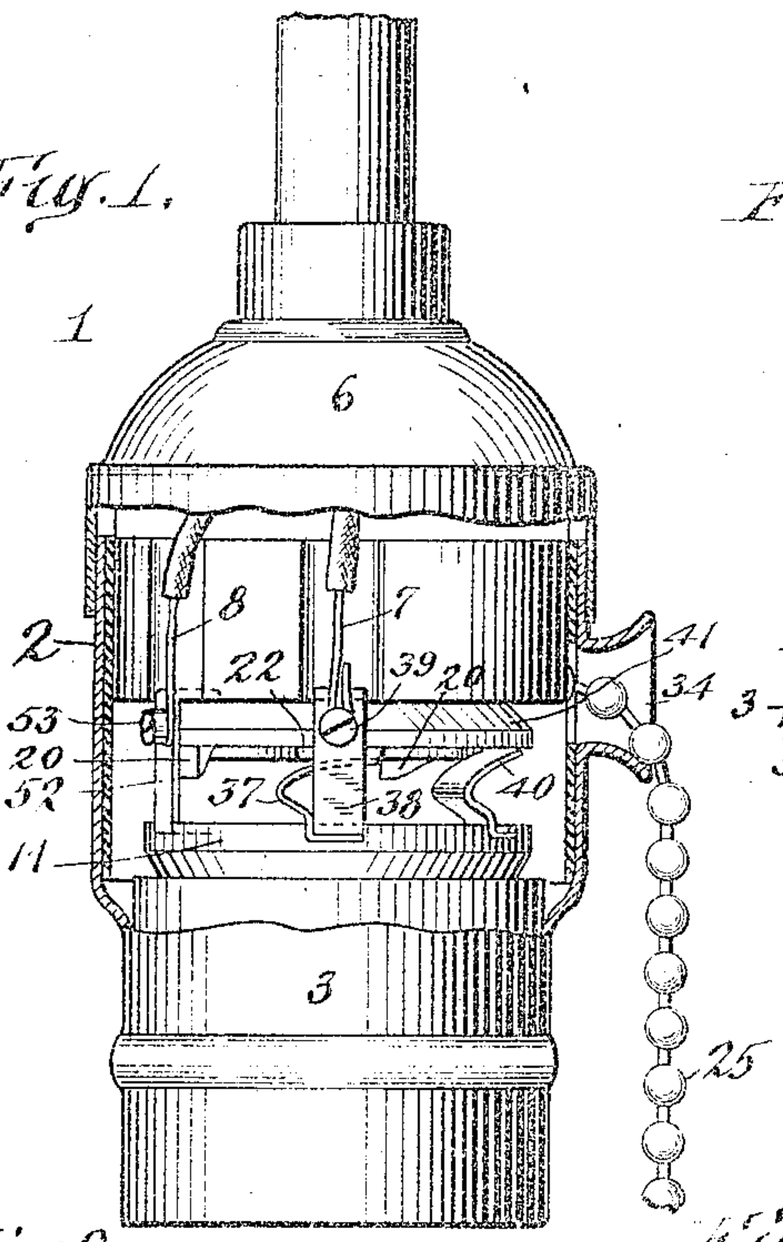


Fig. 2.

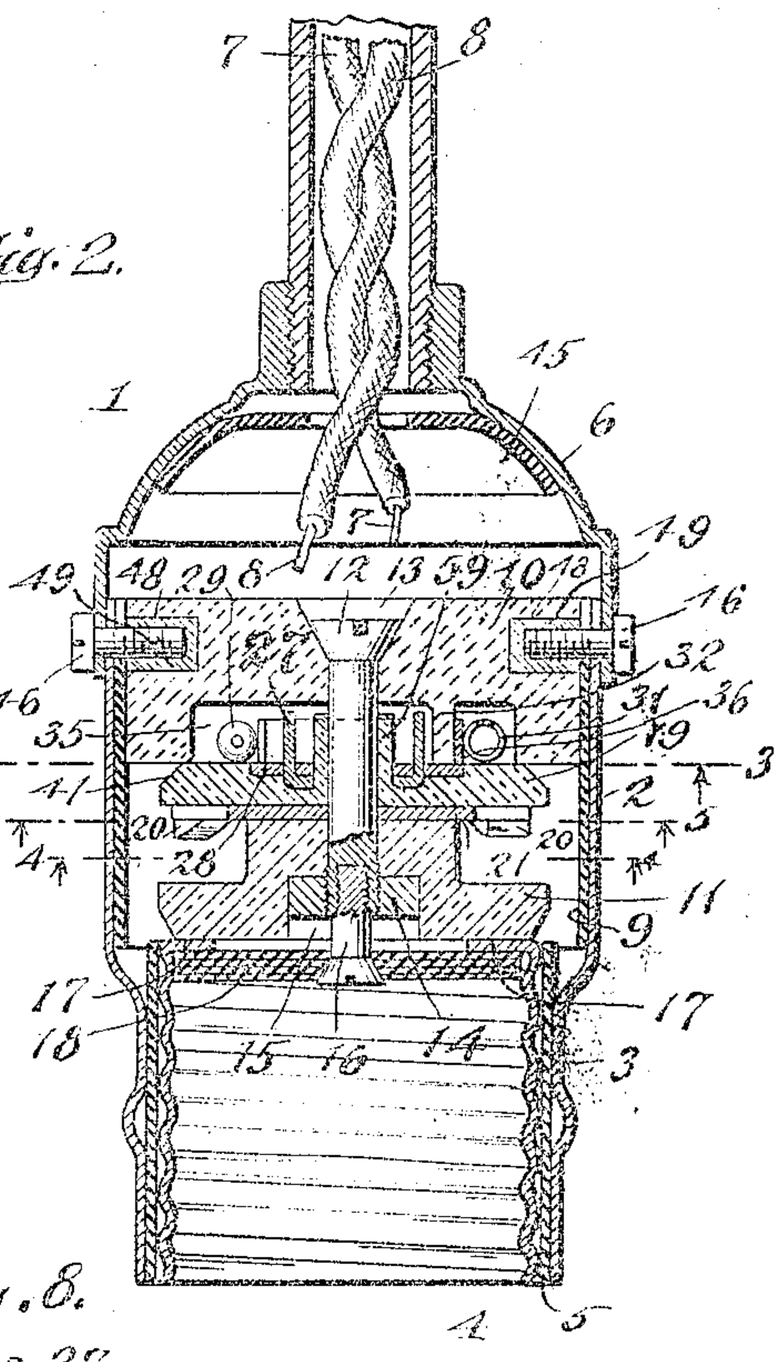


Fig. 9.

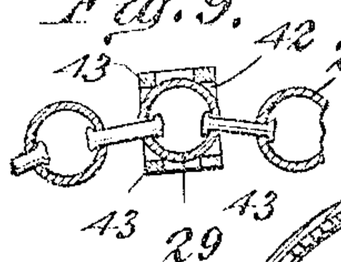


Fig. 3.

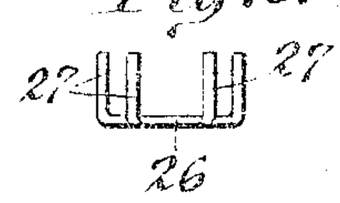


Fig. 8.

Fig. 4.

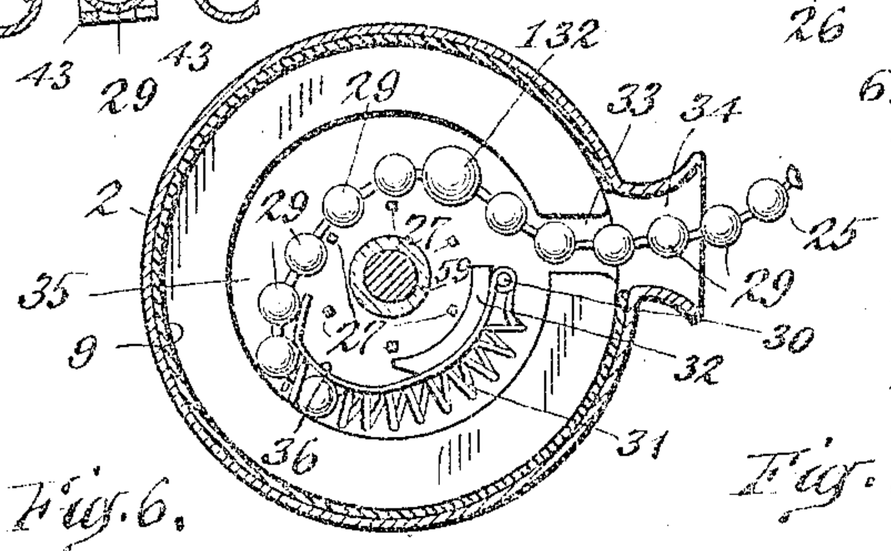


Fig. 6.

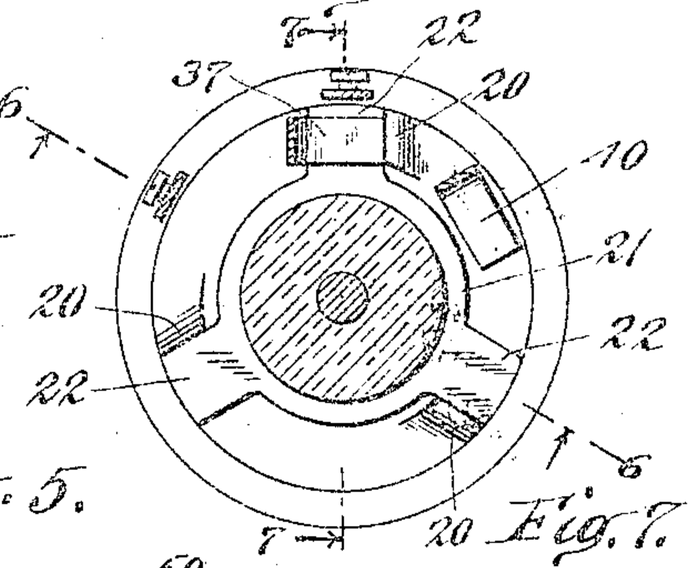
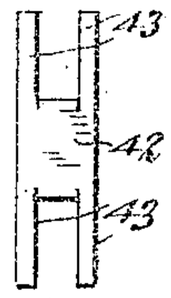
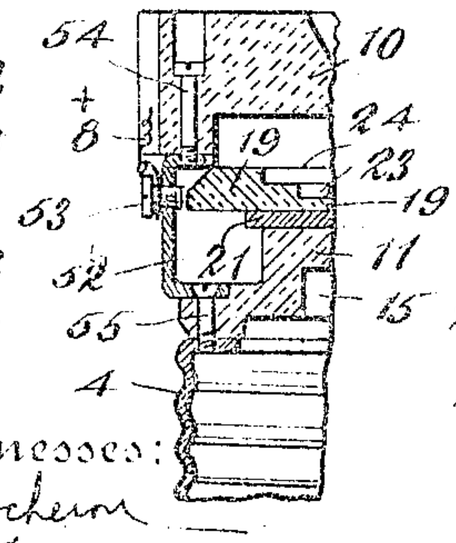


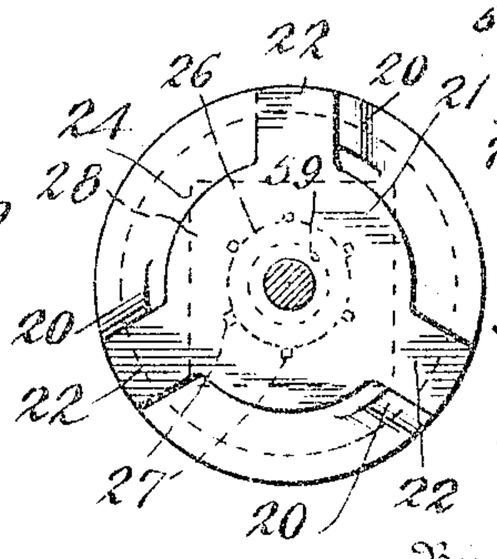
Fig. 5.

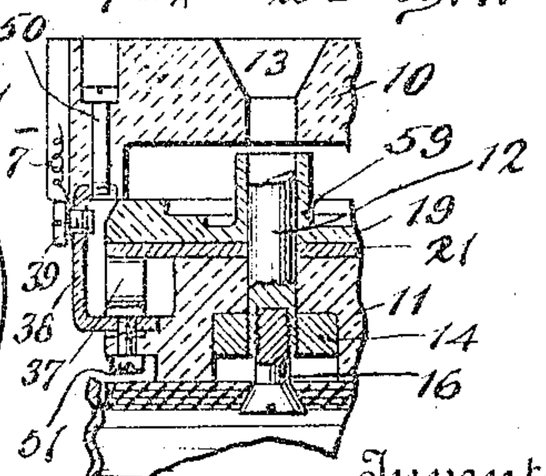
Fig. 7.

Fig. 10.









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UNITED STATES PATENT OFFICE.

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PULL-SOCKET.

No. 921,969. Specification of Letters Patent. Patented May 18, 1909.

Application filed June 26, 1908. Serial No. 440,548.

To all whom it may concern:

Be it known that I, MICHAEL J. FLYNN, a citizen of the United States, and a resident of the city of New York, county of New York, and State of New York, have invented certain new and useful Improvements in Pull-Sockets, of which the following is a specification, taken in connection with the accompanying drawing, which forms a part of the same.

This invention in its simplest form is a mechanical movement which I have shown for purposes of illustration adapted to operate an electric switch in a pull socket, but it is to be understood that in its broadest aspect, the invention is a mechanical movement, and, while ordinarily it may be used as a switch operating mechanism, it is adapted for universal application and is not to be limited to this particular use.

This invention also covers the combination of the mechanical movement and a pull socket.

In the accompanying drawing showing an illustrative embodiment of this invention and in which the same reference numerals refer to similar parts in the several figures, Figure 1 is a side elevation of my improved pull socket, a portion of it being broken away to better illustrate some of the internal mechanism. Fig. 2 is a longitudinal vertical section through the pull socket. Fig. 3 is a transverse horizontal section on the line 3—3 of Fig. 2 looking in the direction of the arrows, showing the flexible driving member in position to operate the driven member. For purposes of better illustration the entire pull socket is shown in Fig. 3 as turned or rotated sufficiently to show the throat 34. Fig. 4 is a transverse horizontal section on line 4—4 of Fig. 2, looking in the direction of the arrows. Fig. 5 is a bottom plan view substantially on the line 5—5 of Fig. 2, looking in the direction of the arrows, the screw being shown in section. Fig. 6 is a fragmentary vertical section on the line 6—6 of Fig. 4 turned right side up. Fig. 7 is a fragmentary vertical section on line 7—7 of Fig. 4 turned right side up. Fig. 8 is a side elevation of a detail. Fig. 9 is a vertical section of a driving member showing a modified form of stop. Fig. 10 is a detail view of the stop shown in Fig. 9.

In the illustrative embodiment of this invention shown in the drawing 1 is a pull socket having a shell 2 which has a lower reduced portion 3 within which is mounted one of the contacts 4 in the form of a screw threaded cylinder separated from the reduced portion 3 by any suitable insulating material, such as fiber 5. The upper portion of the shell 2 is closed by a cap 6, through which pass the wires 7 and 8, the latter being the positive and the former the negative.

Within the shell 2 and separated from it by any suitable insulating material 9 I mount insulating blocks 10 and 11, securing them together by any suitable mechanism, such for instance, as a screw 12, the head of which may be countersunk in the insulating block 10 as at 13, the other end of the screw being screw threaded and coöperating with female screw threads in a nut 14 which is mounted in a recess 15 in the lower insulating block 11. The end of the screw 12 is itself tapped to form female screw threads for the reception of male screw threads upon a secondary screw 16, which may be used to bind the inturned flanges 17 of the screw threaded contact 4 to the lower insulating block 11, some suitable insulating material 18 preferably being mounted adjacent to the inturned flanges 17, see Fig. 2. This screw 12 with its secondary screw 16 is, as will later be pointed out, one of the contacts for the lamp or similar consuming device, the current passing through the contact 4, the lamp dynamo or similar consuming device and back through the screws 16 and 12 to the wire 7, in a manner to be hereinafter described. Between the two insulating blocks 10 and 11 I mount a driven member, which in this form of my invention, is a rotatable disk 19 upon the lower surface of which I preferably form one or more cams 20, three such cams being shown in Fig. 5, see also Figs. 1, 3 and 4. Located between the block 11 and the driven member 19 I mount a switch plate 21 made of any suitable conducting material and form it with as many arms 22, 22 as there are cams 20, 20, three being preferably used, though this number may be varied without departing from my invention. This plate is so mounted that it is caused to move with the driven member 19 and is always in electrical contact with the screw 12 upon which it turns. The driven member 19 is in this form of my invention, made of any suitable insulating material, such for instance as porcelain or fiber and is preferably provided

with two recesses 23 and 24 upon its upper face (Fig. 6) though this number may be varied if desired. The former is of greater depth than the latter and may be given any desired configuration for the reception of a member adapted to engage with the flexible driving member 25. I have shown for purposes of illustration a plate 26 stamped out of any suitable material having fingers 27, 27 which are cupped or bent substantially at right angles to the body portion 26; six of such fingers being preferably used but this number may be increased or diminished as found convenient.

The larger recess 24 is given a non-circular contour, being preferably formed square as shown in dotted lines in Fig. 5 for the reception of a square or non-circular plate 28 formed with apertures or perforations for the reception of the fingers 27 on the plate 26, see Fig. 2. The arrangement is such that the locking plate 28 serves to hold the plate 26 to the driven member 19 and prevents any relative rotation between plate 26 and the driven member 19. It is to be understood of course, that if desired, the locking plate 28 may be omitted and any other means may be used to secure the plate 26 to the driven member 19. The plate 26 and the locking plate 28 are insulated in any suitable manner from the screw or center contact 12, preferably by forming a hollow trunnion 59 on the driven member 19 through which passes the screw 12, Fig. 2.

The flexible driving member 25 may be formed of any suitable material which is adapted to engage and disengage the cooperating surfaces carried by the driven member 19. I have shown in the drawing my flexible driving member in the form of a chain having a plurality of connected spheres or balls 29, 29 and connected to the insulating block 10 in any suitable manner as for instance by a suitable retracting means connected to the insulating block. For purposes of illustration I have shown a coil spring 31 having one end connected to the pin 30 fast to the block 10, and its other end secured in any suitable manner to the flexible driving member 25, such for instance as by pressing one of the spheres or balls 29 between two of the convolutions of the flexible spring 31. I may also form a bearing for this retracting means by forming a downwardly extending flange 32 upon the insulating block 10, Figs. 2 and 3.

A pull upon the driving member 25 will cause it to assume the position shown in Fig. 3, where one or more of the balls are adapted to engage with one or more of the upwardly extending fingers 27 of the plate 26, carried by the driven member 19. Further pull or pressure upon the driving member 25 will cause it to positively engage and coöperate with the fingers or other coöperating surfaces of the driven member 19, the movement of the driving member being limited by a stop engaging with the walls of the recess 33 extending through the side of the block 10. I have for purposes of illustration shown this stop formed as an enlarged ball 132 of greater diameter than the passage 33 through the side of the block 10 which passage registers with the throat 34 of the shell 2.

When the strain is removed from the driving member 25, the retracting means 31 will cause it to move back into the chamber 35 in the disk 10, the incline surfaces of the balls acting as cams to permit disengagement of the driving member 25 with the upwardly turned fingers 27 or other coöperating surfaces carried by the driven member. To assist in this operation, I may use another spring 36 which is preferably mounted in the chamber 35 and held on the pin 30, though it may be otherwise mounted if desired. The end of the spring preferably extends beyond the end of the downwardly extending flange 32. This spring 36 however, is merely an additional feature, and may be dispensed with without departing from my invention as my mechanical movement will operate successfully without it. Upon the next pull upon the driving member 25 the same will engage with other fingers 27 of the plate 26 and give the driven member 19 a further partial rotation, the driven member being again released when pressure is removed from the driving member. This continued step by step movement of the driven member 19, may be used for any desired purpose. As here illustrated it is used to operate the contact plate 21, having arms 22, 22 which are adapted to be alternately engaged with an electrical contact 37, held to the insulating block 11 in any suitable manner as by the standard 38 and screw 51. The arms 22 are, as previously noted, mounted adjacent to the shoulders of the cams 21 which cams, upon the rotation of the driven member 19, press downward upon the spring contact 37 until the contact passes the shoulders of the particular cam when the spring contact 37 will instantly spring back into contact with one of the arms 22 of the contact plate 21 making electrical connection through the screws 12, 16 and contact plate 21 with the standard 38, which is in turn in electrical contact with the wire 7, held to the standard 38 by any suitable means as by the binding screw 39. Upon the next downward pull on the flexible driving member 25 the driven member 19, together with the contact plate 20, is given a partial rotation sufficient to move one of the arms 22 away from the spring contact 37, permitting the contact 37 to engage with the surface of the insulating driven member 19. This will break the electrical connection and cut off the current from the lamp, dynamo, or other device, to which

the contacts 4 and 16 may be connected. Upon again placing tension upon the driving member 25, the driven member 19 is given another partial revolution sufficient to bring one of the arms 22 over the spring contact 37, when the electric connection is restored. This continues indefinitely, every other pull upon the flexible driving member 25 serving to make, in this form of my invention, an electric connection in the pull socket.

The cams 20 may be omitted if desired, but they are preferably used to insure an instantaneous contact between the arms 22 and the spring contact 37 to prevent sparking. I may also use a brake or retarding member to yieldingly hold the driven member 19 in any desired position. This member may be formed in any suitable manner, assuming for instance, the shape of a spring 40, having one end fixed to the insulating block 11 and its free end yieldingly pressing against the under surface of the driven member 19.

To readily disconnect the parts and permit the internal mechanism and a portion of the driving member 25 to be inserted within the shell 2 I may bevel the edge of the driven member 19 as shown at 41 Figs. 1 and 2. Instead of using an enlarged ball upon the flexible member to act as a stop, limiting the movement of the driving member, I may, in some cases, merely clamp the member 42 having arms 43, 43 around one of the balls 29 as shown in Figs. 9 and 10 or any other stop may be used.

It is of course to be understood that my invention is not limited to the flexible driving member shown, for any suitable flexible member which is adapted to engage and disengage any coöperating surfaces carried by the driven member, will come within the terms of my invention.

The cap 6 may be provided with an insulating lining 45 and is detachably secured to the shell 2, and the internal mechanism of the pull socket in any suitable manner as by the screws 46, 46 taking into the radial holes 48, 48 in the insulating block 10. If desired, I may in some cases place bushings 49, 49 in the holes 48, 48 to coöperate with the threads of the screws 46, though these may be omitted.

The wire 7 is connected to the standard 38 which in turn has one end connected to the insulating block 10 by means of a screw 50 and its other end is connected to the insulating block 11 by means of a similar screw 51 which is also used to secure the spring electrical contact 37. The other wire 8 is connected in any suitable manner, as by a set screw 53, to a similar standard 52 which is used to assist in connecting the two spaced insulating blocks 10 and 11, one end of the standard being secured to the insulating block 10 by a screw 54 and the other end being secured to the insulating block 11 by means of a screw 55 which in turn assists in securing the contact 4 and the block 11 and in this manner forms an electrical connection between the standard 52 and the contact 4 of the pull socket. These two connected insulating blocks 10 and 11 may be termed the body portion of the internal mechanism of my pull socket.

The lamp or any other consuming device is either directly, or through a suitable plug, screwed into the contact 4 until its complementary contact engages with the contact 16 of the pull socket. Current then passes through the wire 8, standard 52, screw 55 and contact 4 to the consuming device returning through screws 16, 12, switch plate 21, arm 22, spring contact 37 and standard 38 to the wire 7, the current being switched off or on in the manner previously described.

It is to be understood of course that other forms of contacts may be used to coöperate with the consuming device and that the electrical connection above described may be reversed if desired.

Having thus described this invention in connection with several illustrative embodiments thereof, to the details of which I do not desire to be limited, what is claimed as new and what it is desired to secure by Letters Patent is set forth in the appended claims.

1. In a mechanical movement, a flexible driving member adapted to directly engage surfaces carried by the driven member, a driven member having surfaces to coöperate with the flexible driving member, a spring to retract the driving member, and a secondary spring to assist in releasing the engaging surfaces of the driving and driven members when tension is removed from the driving member.

2. In a pull socket the combination of the insulating body portion, a rotatable disk having surfaces to coöperate with a driving member, a flexible driving member, engaging surfaces carried by the driven member, a spring to assist in the disengagement of the driving member from the surfaces carried by the driven member, and a second spring to retract the flexible driving member.

3. In a mechanical movement, the combination of a flexible driving member formed of a plurality of connected balls or spheres, a driven member having fingers to coöperate with balls or spheres, means to retract the flexible driving member and flexible means to assist in disengaging the balls or spheres from the coöperating surfaces carried by the driven member.

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