

H. HUBBELL.

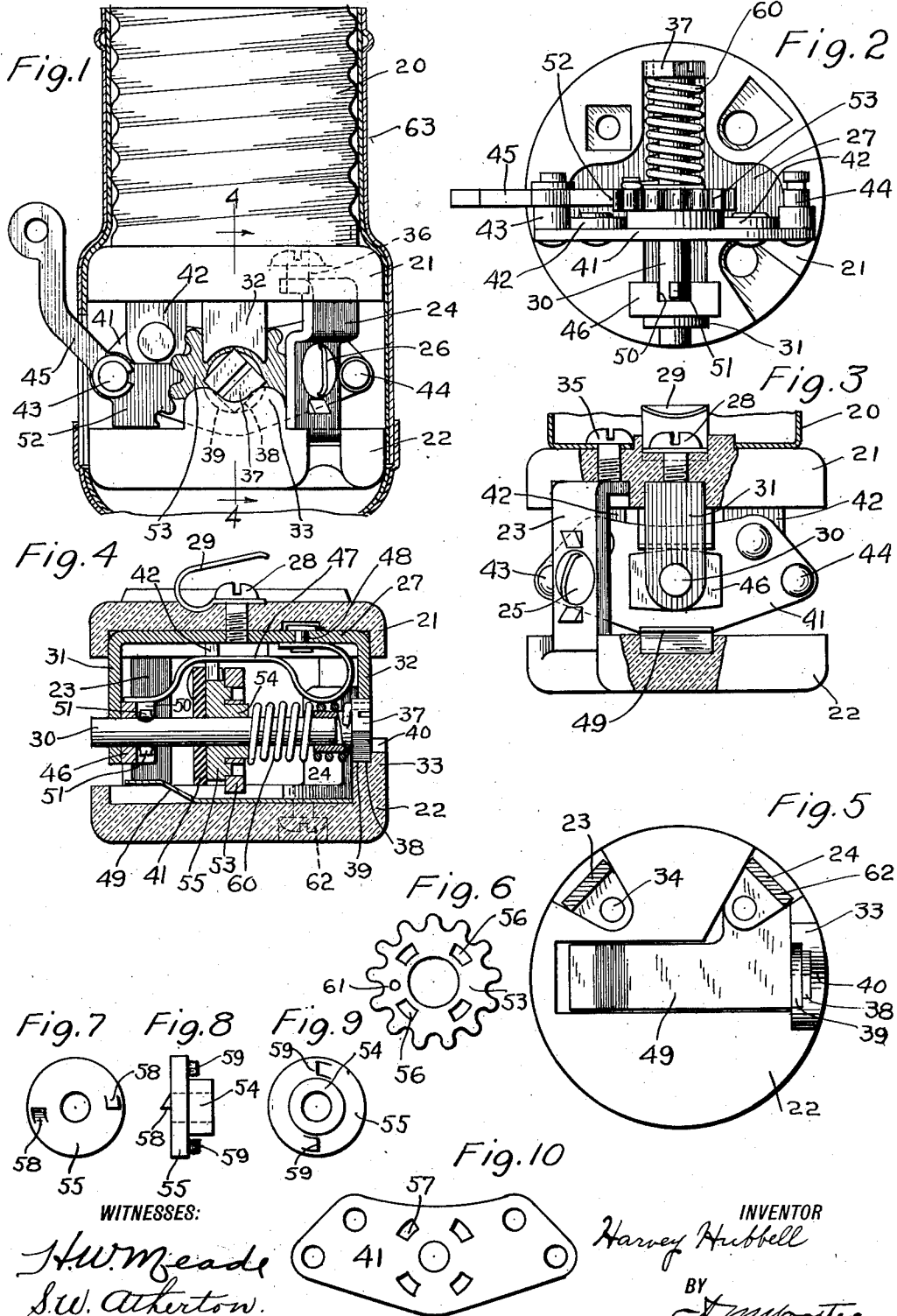
PULL SOCKET.

APPLICATION FILED JUNE 17, 1911.

Patented Feb. 18, 1913.

2 SHEETS—SHEET 1.

1,053,174.



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2 SHEETS—SHEET 2.

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Fig. 11

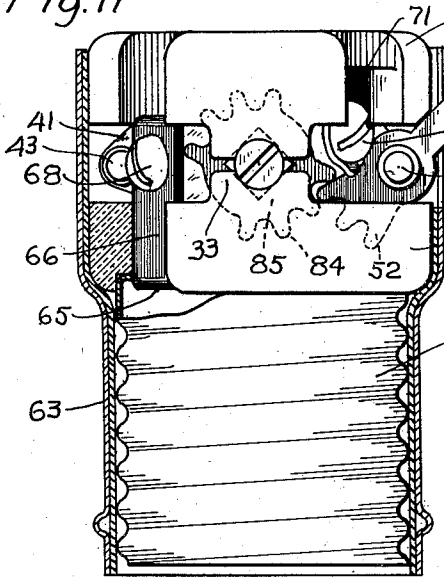


Fig. 12

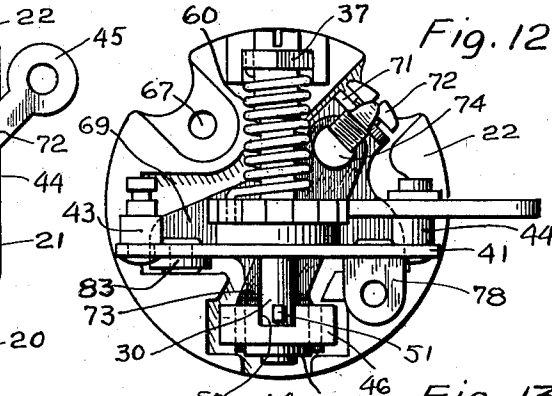


Fig. 13

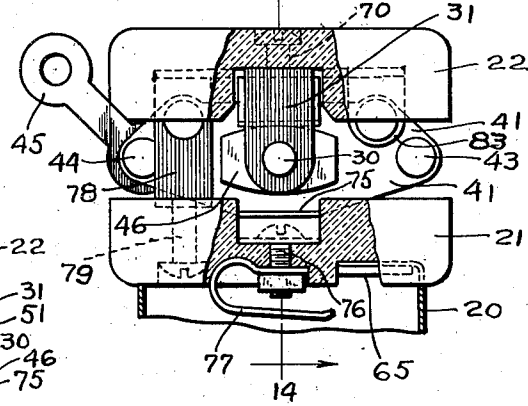


Fig. 14

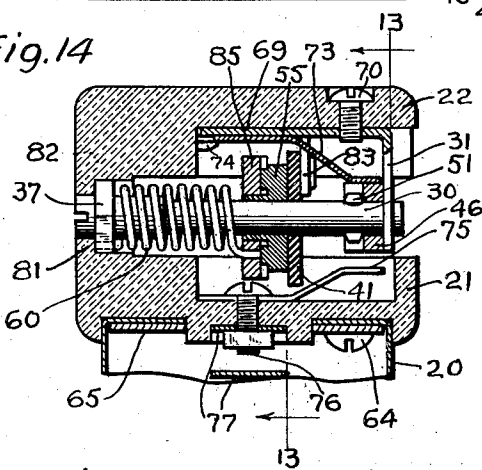


Fig. 15

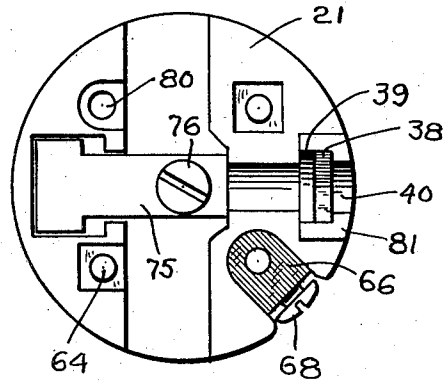


Fig. 16

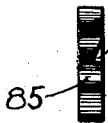
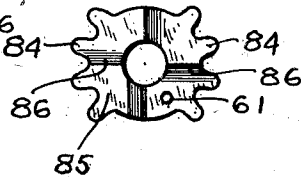


Fig. 17



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PULL-SOCKET.

1,053,174.

Specification of Letters Patent.

Patented Feb. 18, 1913.

Application filed June 17, 1911. Serial No. 633,850.

To all whom it may concern:

Be it known that I, HARVEY HUBBELL, a citizen of the United States, residing at Bridgeport, county of Fairfield, State of Connecticut, have invented an Improvement in Pull-Sockets, of which the following is a specification.

This invention has for its object to generally improve the construction and mode of operation of pull sockets and especially to provide a pull socket which may be operated by a chain or cord attached to a lever not on the shaft of the switch and wholly insulated from the switch mechanism, my novel mechanism accomplishing the desired result with a relatively short movement of the lever and requiring but a relatively short slot in the socket, the lever moreover being pivoted centrally thus avoiding a side pull upon the socket in a direction at right angles to the path of movement of the lever.

An important advantage of the present structure is that I avoid the use of a guide through which the chain must pass and the attachment of the chain to a moving part within the shell. It is of course well understood that the breaking of the chain is the accident most likely to happen to pull sockets and that the break is almost certain to be within the shell, thus putting the lamp out of commission and requiring the services of an electrician to repair it.

In the accompanying drawings forming a part of this specification, in which similar reference characters indicate the same parts in all the views, Figure 1 is an elevation of my novel socket, the shell being shown in section; Fig. 2 is a plan view of the operative parts, looking up as seen in Fig. 1, the lower insulating block and the binding posts being removed; Fig. 3 an elevation, partly broken away, from a point of view opposite to that in Fig. 1; Fig. 4 a section on the line 4—4 in Fig. 1 looking in the direction of the arrows; Fig. 5 a plan view of the lower insulating blocks as seen in Figs. 1 to 4 inclusive, showing the spring contact plate; Fig. 6 an elevation of the insulating gear wheel detached; Figs. 7, 8, and 9 reverse elevations and an edge view of the operating disk detached; Fig. 10 an elevation of the fixed insulating plate detached; Fig. 11 a view similar to Fig. 1 showing a modified construction; Fig. 12 is a bottom plan view of the upper insulating block as shown in Fig. 11 and the operative

parts carried thereby, one of the binding posts being removed. Fig. 13 is a sectional view on the line 13—13 of Fig. 14, this view showing the parts from a point of view opposite to that in Fig. 11. Fig. 14 is a section on the line 14—14 in Fig. 13, looking in the direction of the arrows. Fig. 15 is a plan view of the upper face of the lower insulating block as seen in Figs. 11 and 14, showing the spring contact plate. Figs. 16 and 17 are respectively an edge view and a side elevation of the insulating operating device or gear member detached.

20 denotes the screw shell, 21 and 22 insulating blocks to one of which (block 21) the screw shell is attached, 23 the socket shell, 23 and 24 binding posts, and 25 and 26 binding screws in the respective binding posts.

27 denotes a base plate which is secured to insulating block 21 by a screw 28 which also secures a contact spring 29 to said insulating block, said contact spring being adapted to be engaged by the center contact of a lamp (not shown). Binding post 23 is secured to insulating block 22 by a screw 34 and to insulating block 21 by a screw 35 which also secures the screw shell to said block. Binding post 24 is secured to insulating block 21 by a screw 36 (see dotted lines Fig. 1) and to insulating block 22 by a screw 62 which also secures a spring plate 49 to said block.

30 denotes a transverse shaft, one end of which is journaled in an arm 31 extending from the base plate, the other end being journaled in an angular head 37 which is itself mounted between an arm 32 also extending from the base plate and a boss or projection 33 on insulating block 22. The angular head normally engages an angular recess 38 in boss 33 which locks said head against rotation, said head being adapted when pushed forward slightly to rotate in an annular recess 39 in the boss, for a purpose presently to be explained. An outer recess 40 is provided in said boss to permit the insertion of a screw driver to engage a slot in head 37. This construction will be readily understood from Fig. 5 which see in connection with Fig. 4.

41 denotes a fixed insulating plate through which the shaft passes, rotating freely therein, and which is secured in any suitable manner as to arms 42 which extend from the base plate. The insulating plate, which

may be made of fiber or any suitable insulating material, is provided at its ends with studs 43 and 44, to either of which the operating lever 45 may be pivoted, as will be more fully explained.

46 denotes a cam loosely mounted on shaft 30 which is constantly engaged by a spring 47 attached to the base plate as at 48 and is adapted in the circuit closing position to engage a spring plate 49 which is connected to binding post 24, (see Figs. 4 and 5.) Cam 46 is provided on its inner side with a recess 50 (see Fig. 4) which is loosely engaged by lugs 51 which project from the shaft and cause the cam to rotate with the shaft. It will be noted that spring 47 is curved and re-curved so as to give it great resiliency, the action of this spring, in connection with lugs 51 and the recess in the cam, being to cause the cam to move forward to open and close the circuit with a snap when it passes the center of engagement with spring plate 49. The shaft is operated to open and close the circuit by means of a segment gear 52 on the operating lever which engages an insulating gear wheel 53 loosely mounted on the hub 54 of the disk 55 which is rigidly secured to the shaft, as by a drive fit. Gear wheel 53 may be made of any suitable insulating material, as fiber, and may be either a full gear wheel or a segment. It will be noted that the radius of the pitch line of segment gear 52 is greater than the radius of the pitch line of insulating gear wheel 53. I thus produce a differential action between the segment gear and the insulating gear wheel which gives the required amount of rotation of the insulating gear wheel with a relatively short movement of the operating lever. Insulating gear wheel 53 in this form is provided with angular recesses 56, four in the present instance, and insulating plate 41 is provided with a corresponding number of angular recesses 57. Disk 55 which is rigidly secured to the shaft is provided upon one side with lugs 58, two in the present instance, adapted to engage the recesses in the insulating plate and upon the opposite side with a corresponding number of lugs 59 adapted to engage the recesses in the insulating gear wheel. These lugs have angular engaging faces and inclined backs so as to cause or permit movement in one direction only.

60 denotes a coil spring surrounding the shaft, one end of which is connected to angular head 37 and the other to the insulating gear wheel, the attachment being made in the present instance by bending the ends of the spring parallel with the axis thereof and inserting them in holes in the angular head and in the insulating gear wheel, the hole in the gear wheel being indicated by 61. (See Fig. 6.)

The operation is as follows: When the le-

ver is operated it will cause the insulating gear wheel to carry disk 55 and the shaft forward through the engagement of the walls of recesses 56 in the insulating gear wheel with lugs 59 on the disk which is rigidly secured to the shaft. When the disk is driven forward by the insulating gear wheel, lugs 58 upon the disk will ride out of recesses 57 in the insulating plate and will bear upon the solid portion of the plate between two of the recesses, spring 60 yielding and permitting the shaft and disk to move slightly longitudinally. This movement of the insulating gear wheel both winds the spring and compresses it longitudinally. The instant spring 47 snaps the cam to the circuit opening or closing position spring 60 by its longitudinal expansion will force the insulating gear wheel and shaft forward and cause lugs 58 in the disk to engage recesses 57 in the insulating plate which will lock the disk and shaft against backward movement. When the pull upon the lever is relieved the unwinding of spring 60 will return the insulating gear wheel and the lever to their normal positions, the recesses 56 with which lugs 59 on the disk have been in engagement passing backward away from the lugs (the spring compressing longitudinally) which snap into the other pair of recesses 56 at the end of the backward movement ready to carry the disk and shaft forward again at the next operation of the insulating gear wheel by means of the lever. Should it be required at any time to increase the tension of spring 60 the operator may insert a screw driver in the slot in head 37, push said head forward slightly against the power of the spring out of angular recess 38 and into annular recess 39 and then wind the spring as much as may be necessary to secure prompt return of the lever to its normal position when the pull is removed, and then allow the spring to force the head backward into engagement with angular recess 38.

In Fig. 1, the socket is shown in position to receive a lamp in the upright position. Should it be required to use the socket with a depending lamp the lever would be removed from stud 43 and placed upon stud 44.

In the form of the invention shown in Figs. 11 to 17 the principle of operation is precisely the same as in the other form, the difference being in details of construction and arrangement. Referring to said figures, 20 denotes the screw shell, 63 the socket shell, 21 and 22 insulating blocks, to one of which (the block 21) the screw shell is attached by means of screws 64 which also secure to said shell and to said block 21 a yoke or bridge piece 65 formed integral with a binding post 66 attached at its opposite end to the block 22 by means of a screw passing through an opening 67 (see Fig. 12) in said

block, said binding post being provided with a binding screw 68. 69 denotes the base plate which is secured to the block 22 by a screw 70 said base plate being formed with an integral binding post 71 carrying a binding screw 72. 73 denotes a spring plate secured to the base plate 69 as by a rivet 74, and 75 denotes a second spring plate secured to the insulating block 21 by a screw or bolt 76 which also secures the center contact spring 77 to said insulating block. 78 denotes an arm extending from the base plate 69 and attached to the insulating block 21 by means of a screw or bolt 79 (see Fig. 13) entering an opening 80 (see Fig. 15) in said block 21. The arms 78 together with the binding post 66 constitute means for connecting and spacing the insulating blocks 21 and 22. The binding post 66 to which one of the line wires is attached is, as will be seen, directly connected by means of its yoke piece 65 to the screw shell 20. The other binding post 71 to which the other line wire is attached connects through the base plate 69 and spring plate 73, thence through the circuit closer with the spring plate 75, screw 76 and center contact 77.

The switch or circuit closing mechanism in the present form of the invention is substantially identical with that in the form of the invention first described and need not be referred to in detail except to note the following differences. In the present case the angular head 37 is mounted in an angular recess formed by two bosses 81 and 82 on insulating blocks 21 and 22 respectively. (See Fig. 14.) The insulating plate 41 is secured to the arm 78 on the base plate, which is attached to the insulating block 21, and to a second arm 83 extending from said base plate. Also in the present instance the insulating gear 85, which corresponds in function to the gear 53 in the form of the invention last described, is formed with two separate segments 84 adapted respectively to be engaged by the segment gear 52 on the operating lever, according as said lever is pivoted upon stud 43 or stud 44 of insulating plate 41. In place of the angular recesses 56 with which the gear 53 in the form of the invention last described is provided, the insulating gear 85 is formed on its face adjacent the disk 55 with inclined recesses or grooves 86 which are engaged by the lugs 59 on the disk 55 in the same manner as the recesses 56. It is thought that the operation of this form of the invention will be clear from the foregoing description of the operation of the form first described without further explanation.

Having thus described my invention I claim:

1. A pull socket comprising switch mechanism including a shaft, a disk secured to the shaft and provided with a hub, a spring con-

trolled gear mounted to rotate on the hub, intermediate operating connections whereby the disk and shaft are rotated and a segmental gear engaging the spring controlled gear.

2. A pull socket comprising an insulating plate, a shaft passing through the plate, a disk secured to the shaft and provided with a hub and with means engaging the plate to prevent backward movement, a spring controlled gear mounted on the hub, connections intermediate the gear and the disk, and a segmental gear engaging the spring controlled gear.

3. A pull socket comprising a switch member, an operating lever, pivots for operatively connecting said lever and member, and means whereby said lever may be supported in operative relationship to said member in a plurality of positions with respect thereto.

4. A pull socket comprising switch mechanism including a shaft, an operating lever, a plate provided with means whereby said lever may be fulcrumed thereon in a plurality of positions, and means for operatively connecting said lever and shaft in any position of said lever on said plate.

5. In a pull socket, switch mechanism comprising a shaft, means on said shaft through which it may be rotated in one direction, a gear loose on said shaft, said gear and rotating means being relatively movable longitudinally of said shaft into and out of operative engagement, a spring for normally holding said parts in engagement, and an operating lever having a segmental gear to engage and turn said first named gear.

6. In a pull socket, switch mechanism comprising a plate, a shaft passing through said plate, a disk mounted on said shaft for rotation therewith, an operating device loosely mounted on said shaft, said plate and disk having a set of interengaging recesses and projections and said operating device and disk having a second set of interengaging recesses and projections, a spring for normally holding both of said sets of recesses and projections in engagement, a lever fulcrumed on said plate at one side of said shaft, and means for operatively connecting said lever and operating device.

7. A pull socket comprising a pair of insulating blocks, a binding post extending between and secured to said blocks, a base plate secured to one of said blocks, a spring plate carried by said base plate, a second spring plate carried by the other of said blocks, a shaft supported by said base plate and provided with means for closing the circuit between said spring plates, an insulating plate carried by said base plate, a lever fulcrumed on said insulating plate, and means for operatively connecting said lever and shaft.

8. A pull socket comprising a base plate, switch mechanism connected with said base plate and including a shaft, a lever operatively connected with said shaft for rotating the same, and a fulcrum for said lever carried by said base plate.

9. A pull socket comprising switch mechanism including a shaft, an insulating gear on said shaft for rotating the same, an insulating plate, and an operating lever fulcrumed on said plate and engaging said gear.

10. A pull socket comprising a pair of in-

sulating blocks, a pair of binding posts connecting and spacing said blocks, a base plate secured to one of said blocks and having a pair of arms, switch mechanism including a shaft supported by said arms, a lever for operating said shaft, and a fulcrum for said lever carried by said base plate.

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

HARVEY HUBBELL.

Witnesses:

ARTHUR W. CALVER,
S. W. ATHERTON.