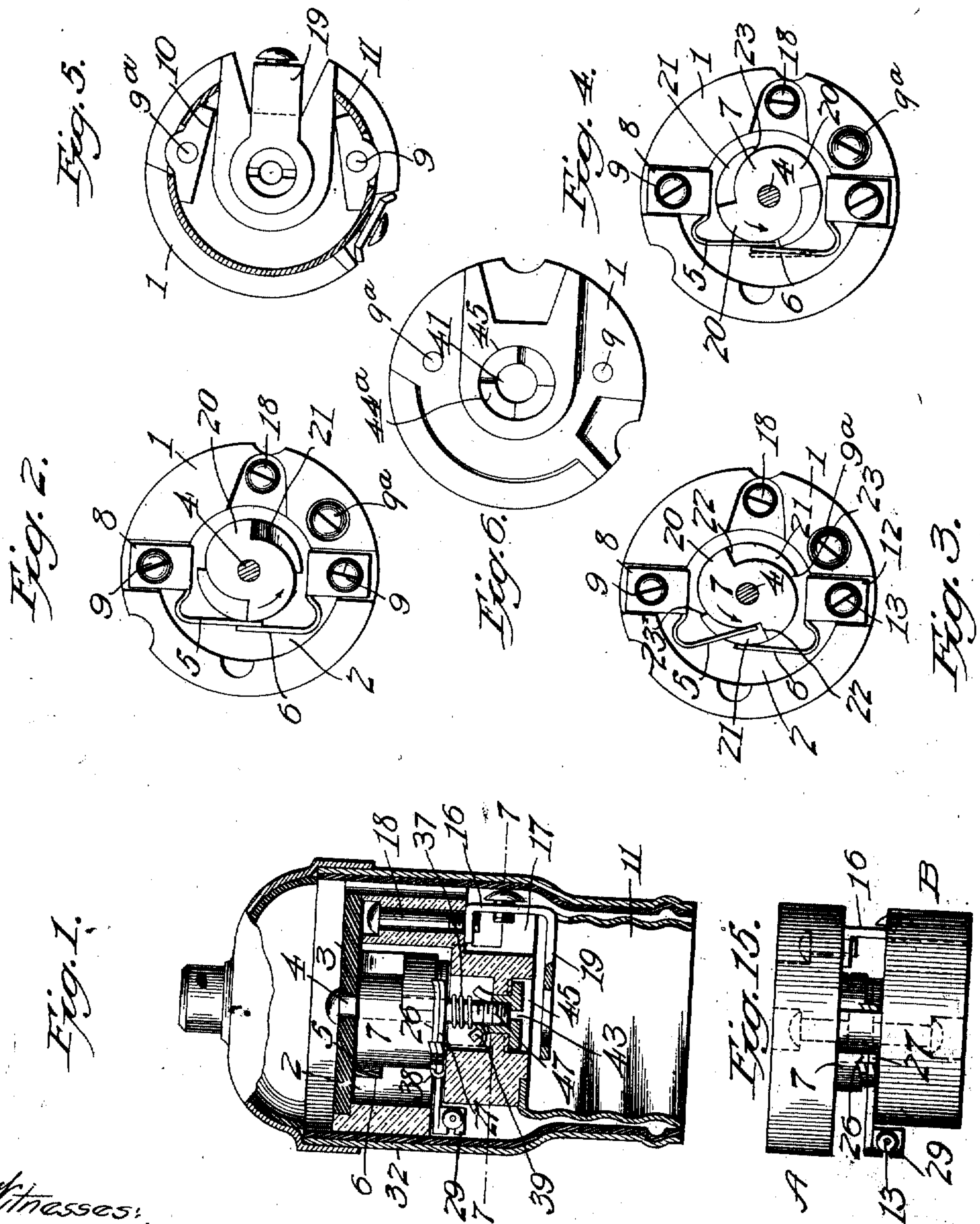


995,244.

Patented June 13, 1911.
2 SHEETS—SHEET 1.



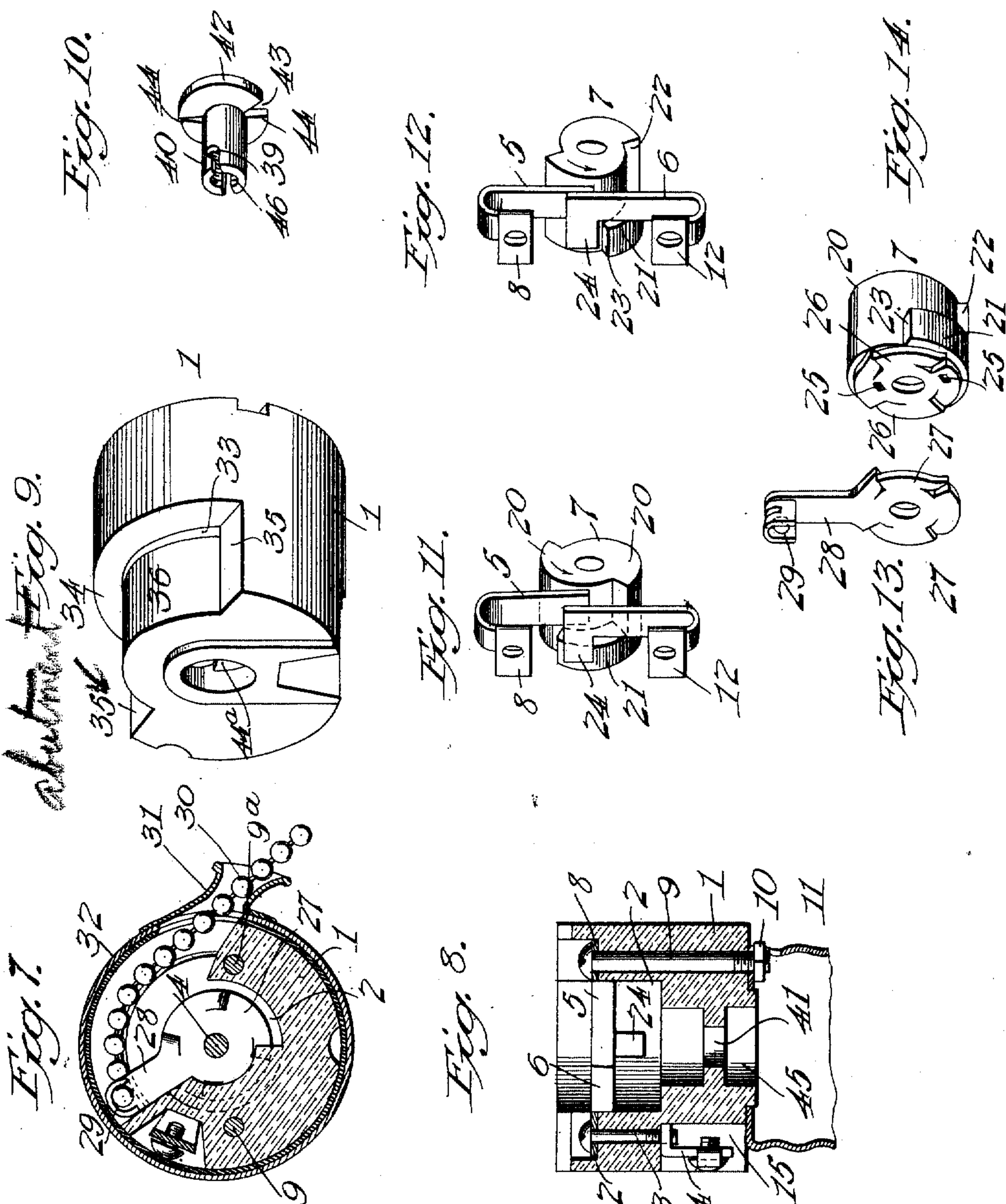
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ELECTRICAL PULL-SOCKET.

995,244.

Specification of Letters Patent. Patented June 13, 1911.

Application filed January 28, 1911. Serial No. 605,208.

To all whom it may concern:

Be it known that I, EDGAR H. FREEMAN, a citizen of the United States, residing at Trenton, in the county of Mercer and State of New Jersey, have invented certain new and useful Improvements in Electrical Pull-Sockets, of which the following is a specification.

This invention relates to the subject of electrical pull sockets for electric incandescent lamps, wherein a pull chain or equivalent flexible pull connection is employed for operating the socket switch to make and break the electrical circuit through the lamp. To this end the invention has in view certain novel and practical improvements that are intended to simplify the manufacture of pull sockets while at the same time obviating many of the objectionable features which are present in some types of sockets of that character now on the market. In this connection the invention contemplates a construction of pull socket which entirely dispenses with the ratchet-commutator which is so commonly employed, and which commutator involves the idea of ratchet inclines either on the porcelain of the socket body or on a rotating member, said inclines alternately presenting metal contact faces and insulating faces that provide for the make and break of the circuit. This method of commutating the current to provide for the make and break of the circuit, usually involves considerable complication in the manufacture of the pull socket, as well as some degree of unreliability and uncertainty in preserving the parts in proper operative relation, whereas the present invention utilizes a plain metal switch of the simplest type, namely, one which consists of a pair of spring contact plates and a controller for causing said plates to meet to close the circuit, and to separate to open or break the circuit.

A special feature of improvement involved in the present invention is that of employing a simple all-metal switch of the type referred to, which comprises means for securing not only a "quick-break" of the circuit, but also a "quick make" thereof, thus more fully satisfying the requirements and preferences of the fire underwriters.

A further general object of the invention is to provide a pull socket having complete and thorough insulation between its metal switch and the pull chain connection where-

by no insulation is required between the pull chain and the lever element to which it connects. Also, the invention provides a novel form of socket body which itself operates as a chain guide thus dispensing with the use of "chain rails" and other equivalent expedients that are commonly employed. Also, the invention provides a novel form of tensioning device for the retracting spring of the operating mechanism.

Other objects of the invention will appear to those familiar with the art, and it will also be understood that structural alterations may be made in the invention without departing from the principle thereof, but preferred and practical embodiments of the same are shown in the accompanying drawings, in which,—

Figure 1 is a longitudinal sectional view of a pull socket embodying the present invention. Figs. 2, 3 and 4 are similar top plan views of the socket body with the cover plate removed and showing the parts of the switch in different positions to illustrate the quick break and the quick make. Fig. 5 is a sectional plan view on the line 5—5 of Fig. 1, with the outside casing omitted. Fig. 6 is a bottom plan view of the socket body to illustrate the ratchet face at the bottom of the recessed seat for the tension-bushing. Fig. 7 is a cross sectional view on the line 7—7 of Fig. 1. Fig. 8 is a sectional view through the socket body, with some of the parts omitted, the view being intended to illustrate that side of the electrical circuit which includes the screw shell contact, the socket switch, and one of the wire terminal plates. Fig. 9 is a detail perspective view of the one piece porcelain block of which the socket body is preferably constructed. Fig. 10 is a detail in perspective of the tension bushing. Figs. 11 and 12 are similar perspective views of the socket switch to illustrate more plainly the quick-make feature thereof. Figs. 13 and 14 are perspective views respectively of the lever element, and the rotary cam fitted with a ratchet member of the operating mechanism. Fig. 15 is a detail sectional elevation showing how the improvements may be adapted to a socket consisting of two insulating blocks or buttons.

Like references designate corresponding parts in the several figures of the drawings.

In carrying out the invention the improvements claimed may be embodied with

a socket body of any suitable construction such for instance as the conventional form of socket body consisting of two suitably connected blocks A and B of insulating material as suggested in Fig. 15 of the drawings, but it is preferable, according to what is now considered to be the best form of the invention, to utilize a socket body 1 consisting of a one piece porcelain or equivalent insulating block designated by the numeral 1. This block 1 is internally recessed to provide an interior housing chamber 2 for the principal working parts of the switch and its operating mechanism, and said chamber is closed at what may be designated the lower or bottom part thereof (which carries the screw shell contact to be referred to) while the upper or top end of said chamber is open and adapted to be covered by a removable cover plate 3 of insulating material. The said cover plate serves to thoroughly insulate and close in the metal parts of the switch and its operating mechanism and may be conveniently held in place by means of the center spindle 4 which serves to support and carry the principal parts of the device as will presently more fully appear. Also, the socket body 1 is constructed with other features that will be referred to in connection with the parts directly cooperating therewith.

As above indicated, the socket switch of this invention is of a very simple type, namely one which consists of a pair of spring contact plates 5 and 6 and a cooperating controller 7 for causing said plates to meet to close or make the circuit, and to separate to open or break the circuit. The spring contact plates 5 and 6 are suitably arranged within the upper and larger part of the housing chamber 2 and are both located at the same side of the controller 7 and its supporting spindle 4. These plates 5 and 6 have a snapping action to secure the quick-make and the quick break, and while the same may be in different shapes, it is essential that their free ends move into and out of contact with each other. One of the plates, 5, lies inside of the other plate, 6, and is provided at its fixed end with a holding flange 8 which may be conveniently secured in place by the fastening and conducting screw 9 that is arranged in a screw hole in the socket body and has a fastening connection 10 at one end with the flange of the screw shell contact 11 which is secured upon the lower end of the socket body by the said screw 9 and a companion screw 9^a. The other and outer of said springs 6 is provided at its fixed end with a holding flange 12 receiving a combined fastening and conducting screw 13 arranged in a screw hole in the block 1 and also serving to support in place one of the wire terminal plates 14 which is arranged in an external recess 15 in the said

block or body 1. This line of connections for one side of the circuit is plainly shown in Fig. 8 of the drawings, and the other side of the circuit consists of the wire terminal plate 16 seated in a side recess 17 of the socket body, held in position by a fastening screw 18 and having formed integrally therewith an elbow plate 19 extending over the bottom of the socket body, and within the screw shell contact 11, to form the center plug contact.

The controller 7 of the switch is a block of insulating material and is shaped to form a cam having separate sets of cam faces 20, 20, and 21, 21 respectively in different transverse planes, but all extending in the same circular direction. Each of said separate cam faces 20, 20 and 21, 21, terminates at a radial inset clearance shoulder, the shoulders for the faces 20 being designated by the number 22 and the shoulders for the faces 21 being designated by the number 23, and all of said shoulders providing means whereby the contact plates cooperating therewith are permitted to have a snapping action when the shoulders are reached, so that a quick make and a quick break may be accomplished.

The outer contact spring 6 is formed at its free end with a bearing extension 24 projecting at one side of the other spring contact plate to engage the set of cam faces 21 as best seen in Figs. 3, 11 and 12 of the drawings. It will thus be observed, by reference to Figs. 2, 3, 4, 11 and 12 of the drawings, that with the spring contact plates in engagement to close the circuit as shown in Fig. 2, the rotation of the cam 7 in the direction of the arrow, that is to say a movement of the cam in the direction of the arrow from the position shown in Fig. 2, brings the cam to a position where one of the clearance shoulders 22 passes the free extremity of the spring 5 with the result that the latter snaps inwardly away from the spring 6 which is held out by one of the cam faces 21, as plainly shown in Fig. 3, Fig. 2 simply being intended to show a position of parts while the cam is in action and just before it reaches the position shown in Fig. 3. In the position shown in Fig. 3 the spring 5 obviously acts as a check pawl to prevent backward rotation of the cam during the retracting movement of the pull lever as will further appear.

To make or close the circuit the cam 7 is given a quarter turn from the position shown in Fig. 3 to the position shown in Fig. 4. In passing to the position shown in Fig. 4, it will appear from Fig. 11 that the bearing extension 24 of the plate 6 rides upon one of the cam faces 21 as the spring 5 is being moved out upon one of the cam faces 20, but before the two plates are brought into contact, the extension 24 snaps over one of

the shoulders 23 and into engagement with the spring 5 thus securing the quick make referred to.

The rotary insulating cam 7 is loosely arranged on the center spindle 4 and has suitably secured to one end thereof, as by the fastenings 25, a stamped or equivalent ratchet plate 26 coöperating with a stamped or equivalent ratchet member 27 also loosely hung on the spindle 4 and having formed therewith the pull lever 28 provided at its outer extremity with a chain clip or holder 29 in which is hung or connected the inner end of the pull chain 30, which is illustrated as extending through a chain guide 31 carried by the external socket casing 32, although any form and mounting of chain guide may be employed to direct the chain to the outside of the socket.

According to the present invention, the pull lever 28 extends through, and is guided in a segmental guide slot 33 piercing one side of the socket body. At the same side of the latter in which the slot is formed, the said body or block 1 is provided with an external segmental recess 34 producing terminal stop shoulders 35, to limit the movement of the pull lever in both directions, and also producing a curved guiding wall 36 which forms a bearing surface over which the chain 30 is guided without the necessity of employing chain rails or equivalent expedients such as commonly used in this connection.

The pull lever 28 is normally retracted under the impulse of a retracting spring 37, one end of which as at 38 engages with the pull lever or its ratchet member 27, and the other end of which is engaged in one of the notches 39 of a tension bushing 40. This bushing is swiveled in a bearing opening 41 formed in the bottom of the socket body and is provided with an external head 42 having a screw driver slot 43 therein and the edges of which slot are deflected to produce inner ratchet teeth 43 adapted to ride over and engage with the shoulders of the ratchet teeth 44 which are formed at the bottom of the recessed seat 45 formed within the socket body for the reception of the head 42. The bushing 40 is interiorly threaded as at 46 to receive the threaded end 47 of the screw which constitutes the center spindle 4. To increase the tension on the spring 37 it is only necessary to first loosen the screw spindle 4 and then insert a screw driver in the slot 43 and rotate the bushing 40 in one direction, the ratchet teeth 44 serving to check backward rotation. To loosen the tension on the spring, the screw spindle 4 is turned back sufficiently until it can be moved longitudinally enough to disengage the head 42 from the ratchet face 44 and admit of backward turning of the bushing.

I claim:

1. A pull socket comprising a body, a switch consisting of a pair of spring plates, and a rotary insulating cam having separate sets of cam faces respectively in different planes and each terminating in an inset clearance shoulder, said separate sets of cam faces and shoulders respectively engaging the separate spring plates to alternately effect a quick-make and a quick-break, and cam rotating means.

2. A pull socket comprising a body, a switch consisting of a pair of spring plates, and a rotary insulating cam having separate sets of cam faces and inset clearance shoulders in different planes and respectively engaging the separate spring plates to alternately and successively snap the same, and cam rotating means.

3. A pull socket comprising a body, a switch consisting of a pair of spring plates, and a rotary insulating cam having separate sets of cam faces and inset clearance shoulders in different planes and respectively coöperating with the separate spring plates to alternately and successively snap the same, and ratchet means for rotating the cam.

4. A pull socket comprising a body, a switch consisting of a pair of opposing spring plates, one of which is provided with a terminal bearing extension, and a rotary insulating cam having separate sets of cam elements in different planes and respectively engaging one spring plate and the bearing extension of the other spring plate, and cam rotating means.

5. A pull socket comprising a body, a switch consisting of a pair of metal spring plates arranged in the same plane and one of said plates having an extension, and a rotary insulating cam having means in different planes for alternately snapping the spring plates, and all-metal ratchet operating means for the cam.

6. A pull socket comprising a body having a lateral segmental guide slot, a switch, and switch operating means including a pull lever extending through said slot.

7. A pull socket comprising a body having a lateral slot and an external segmental guiding wall, a switch, and switch operating mechanism including a lever extending through the slot, and a pull chain connected to the lever and operating over said wall.

8. A pull socket comprising a body having a lateral slot, and an external segmental recess, a switch, and switch operating means including a pull lever extending through the slot and having a terminal chain holder operating within said recess, and a pull chain fitted to said holder.

9. A pull socket comprising a body having a series of ratchet teeth, a switch, switch operating mechanism including a retracting spring, a tension bushing swiveled in the

body and having ratchet elements, and means for freeing the bushing to permit it to yieldingly rotate over the said ratchet teeth of the body.

- 5 10. A pull socket comprising a body having a ratchet face, a switch, switch operating mechanism including a lever, a retracting spring, and a center screw supporting spindle, and a tension bushing swiveled in the
10 body and having ratchet elements engaging

said ratchet face, spring-engaging portions, and a threaded portion engaged by the threads of said spindle.

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

EDGAR H. FREEMAN.

Witnesses:

JOHN B. RUPPRECHT,
GEO. S. MAGUIRE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
