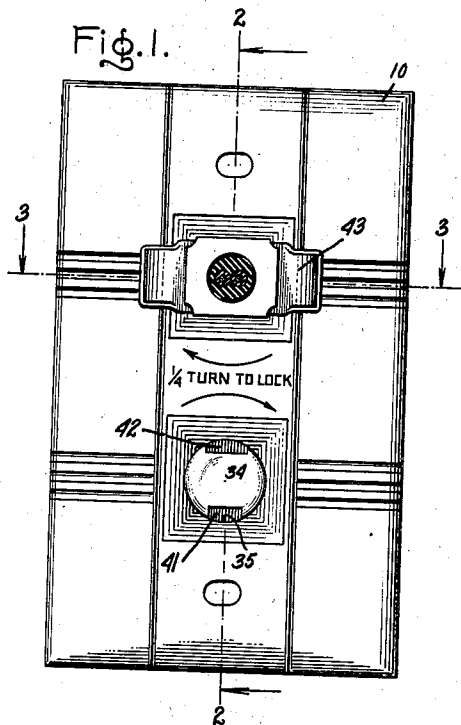
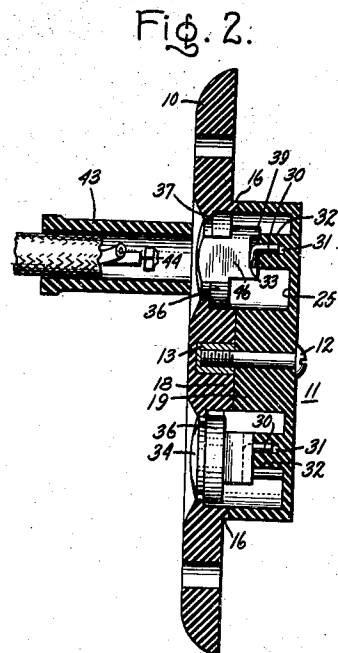
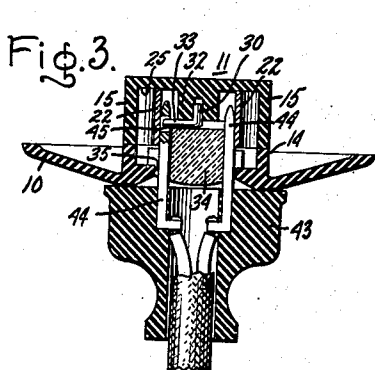
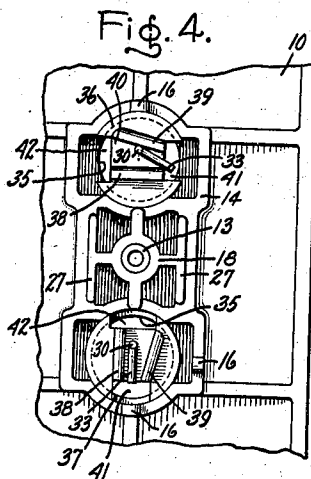
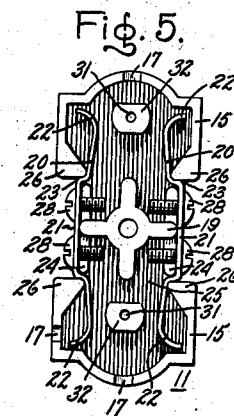
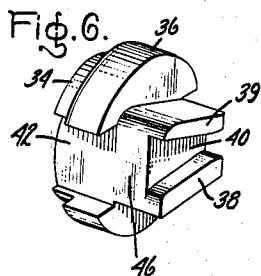


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ELECTRICAL RECEPTACLE

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ELECTRICAL RECEPTACLE

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The present invention relates to electrical receptacles, and more particularly to a receptacle having means for locking an attachment plug cap thereto.

It is an object of this invention to provide a receptacle having locking means adapted to co-operate with the blades of a standard attachment plug cap.

It is another object of this invention to provide a simple and rugged receptacle construction which is economical to manufacture.

It is a further object of this invention to provide a receptacle having an actuating member adapted to be rotated by the blades of an attachment cap positioned in the receptacle, the rotation of the actuating member being effective to force a locking member into engagement with one of the blades of the attachment cap.

Further objects and advantages of the present invention will become apparent as the following description proceeds, reference being had to the accompanying drawing, in which Fig. 1 is a front elevation of a wallplate and receptacle embodying the present invention and showing an attachment plug cap locked to the receptacle; Fig. 2 is a sectional view taken along the line 2—2 of Fig. 1; Fig. 3 is a sectional view taken along the line 3—3 of Fig. 1; Fig. 4 is a rear view of the wall plate having its edge portions partially broken away; Fig. 5 is a front elevational view of the receptacle body showing the stationary contact and terminal structure, and Fig. 6 is a perspective view of one of the actuating members provided for operating the locking means.

Referring to the accompanying drawing, a housing for the parts of the receptacle is provided by a wall plate 10 and a receptacle body 11, both of which are formed of a comparatively rigid insulating material such as a phenolic condensation product. The receptacle body which is recessed from its upper face to form a substantially hollow body is secured to the rear face of the wall plate by a bolt 12 having threaded engagement with an insert 13 centrally located in the wall plate. An upstanding bead 14 is formed on the rear face of the wall plate to provide a bearing surface for the upper edge of the side walls 15 of the receptacle body. Projecting lugs 16 on the bead 14 engage corresponding slots 17 in the walls of the receptacle body to position the parts of the housing relative to one another. Cross-like structures 18 and 19 are molded integrally with the wall plate and receptacle body respectively to strengthen the molded parts and form an additional bearing surface between the

wall plate and receptacle body adjacent the holding bolt 12. While in the construction described above the cover member for the receptacle body also forms a wall plate, it is apparent that a separate cover may be provided if desired.

The stationary contact and terminal structure of the receptacle is provided by a pair of conducting strips 20 each of which comprises a central offset terminal portion 21 and a pair of curved contact surfaces 22 formed at each end thereof. The contact and terminal strips are preferably sheet metal stampings of good conducting material. The strips are mounted edgewise in the receptacle body adjacent the opposite side walls with the offset terminal portions positioned in the recesses 23 which are formed in the middle of the side walls of the receptacle body. The contact portions of the conducting strips 20 are laterally unsupported and are free to engage resiliently the contact blades of an attachment cap when they are positioned in the receptacle. A longitudinally extending bead 24 is provided on the floor 25 of the receptacle adjacent the inner surface of each of the conducting strips to hold them against the abutments 26 formed adjacent the recesses 23 by thickened portions of the side walls 15. Corresponding longitudinally extending beads 27 are formed on the inner face of the wall plate and co-operate with the upper edges of the conducting strips to hold them in position. Suitable binding screws 28 threadingly engage the terminal portions of the conducting strips and provide means for attaching the circuit wires thereto.

According to the invention the contact blades of an attachment cap are positioned in suitable openings formed in the receptacle housing and the cap then given a partial turn to move the blades into engagement with the stationary contacts of the receptacle, the movement also being effective to project a locking member into the usual opening formed near the end of a blade of a standard attachment plug cap. In the drawing, a duplex receptacle is shown but, since both of the outlets and their associated locking mechanisms are of the same construction, only one will be described. A locking member in the form of a substantially L-shaped pin has one arm 30 journaled in a suitable opening 31 formed in an upstanding boss 32 which is preferably molded integrally with the floor of the receptacle body. The other arm 33 of the locking member projects laterally beyond the edge of the boss in a plane parallel to the floor of the receptacle.

For operating the locking pin an actuating

member in the form of a plug 34 of insulating material of generally cylindrical shape is provided. The outer end of the plug is mounted for rotation in a suitable circular opening 35 formed in the wall plate. A flange 36 extending from the outer wall of the insulating plug 34 cooperates with a shoulder 37 on the inner face of the wall plate to hold the plug against the boss 32 formed on the floor of the receptacle body. A driving connection between the plug 34 and the locking pin is provided by the spaced depending ribs 38 and 39 which extend divergently across the lower face of the insulating plug 34 and define a tapered groove 40 for the reception of the laterally extending arm 33 of the locking pin. The plug 34 is provided with axially extending recesses or openings 41 and 42 diametrically opposite points on its outer surface for the reception of the contact blades of an attachment plug cap. The attachment plug cap may be of any suitable construction and as illustrated comprises a body of insulating material 43 having a pair of spaced parallel contact blades 44 which in accordance with the usual practice are provided near their free ends with a small circular opening 45. The side walls of the recesses are spaced to cooperate with the contact blades of the attachment cap to form a driving connection between the insulating plug and the attachment cap. When the contact blades 44 of the attachment cap are positioned in the recesses 41 and 42 they extend into the receptacle body adjacent the opposite side walls 46 of the insulating plug which in the preferred construction illustrated form extensions of the bottom walls of the recesses 41 and 42.

As shown in Figs. 2 and 4 the boss 32 projecting from the floor of the receptacle body and the locking pin, which in the construction shown is pivoted on the boss, are positioned eccentrically with respect to the actuating member or plug 34. This eccentric mounting causes relative transverse movement between the insulating plug and the locking member and serves to move the locking pin from its unlocked to its locked position in response to rotation of the insulating plug. As used above the word "transverse" is intended to indicate movement in a plane generally perpendicular to the axis of rotation of the plug 34 and is not meant to be limited to movement along either axis of the receptacle body. In the drawing, the outlet in the upper portion of Figs. 1, 2 and 4 is shown with its parts in locked position, while the parts of the outlet shown in the lower portions of these figures are shown in the unlocked position. From an inspection of Fig. 4 it is apparent that the arm 33 lies in a plane perpendicular to the axis of rotation of the plug 34 and is of such length that its outer end does not project beyond the lower edge of the wall 46 of the insulating plug when the arm 33 extends along the longitudinal axis of the receptacle body as it does when the locking mechanism is in its unlocked position. When the plug 34 is rotated a quarter turn in a counterclockwise direction as viewed in Fig. 4, the outer end of the arm 33 moves beyond the wall 46 and into alignment with recess 41 formed in the insulating plug. As illustrated in Fig. 3, this movement is effective to move the outer end of the arm 33 into the opening 45 of the contact blade positioned in the recess 41. The groove 40 formed on the lower surface of the insulating plug 34 is only slightly wider at one

end than the arm 33 of the locking pin in order to limit the circumferential movement of the arm relative to the plug. Near the center of the plug the recess is wide enough to accommodate the shifting of the plug with respect to the locking pin that results from the eccentric mounting of the pin and plug.

In using a receptacle with the locking feature of the present invention the contact blades 44 of an attachment plug cap are inserted in the recesses 41 and 42 of the insulating plug 34 when the plug is in the position shown in the lower portions of Figs. 1, 2 and 4. At this time the end of the locking arm 33 is flush with the lower edge of the wall 46 of the insulating plug 34. The blades 44 extend into the recessed receptacle body 11 beyond the lower edge of the insulating plug 34 and the boss 32. The attachment cap is then rotated a quarter turn in a clockwise direction as viewed in Fig. 1, and because of the engagement of the contact blades with the walls of the recesses 41 and 42 the insulating plug 34 is rotated a like amount. During rotation of the insulating plug the arm 33 of the locking pin is engaged by one of the depending ribs 38 on the face of the insulating plug and moved to the position shown in Fig. 3. It is seen that the end of the locking arm is moved beyond the edge of the insulating plug into the path of the contact blade and into the opening 45 formed near the end thereof. The pin which is held in the housing by the insulating plug engages the wall of the opening 46 and prevents the attachment cap from being accidentally withdrawn from the receptacle. When the attachment cap and plug 34 are rotated from their unlocked to their locked position the contact blades 44 are moved into engagement with the resilient contacts 20 which aid in positioning the attachment plug cap relative to the receptacle and form resilient means opposing the accidental rotation of the attachment plug cap and the insulating plug 34. To release the plug cap it is only necessary to rotate it in a reverse direction for a quarter turn thus returning the locking mechanism to its unlocked position as shown in the lower portion of Fig. 4.

With the construction described above a receptacle is provided with means for positively locking a standard attachment plug cap thereof. At the same time, a relatively simple and rugged structure is provided which may be manufactured at low cost.

What I claim as new and desire to secure by Letters Patent of the United States, is:

1. In a plug receptacle, a housing, a first member of insulating material rotatably mounted in said housing and having recesses formed therein for the reception of the contact blades of an attachment plug cap, a second insulating member projecting from the floor of said housing and positioned eccentrically with respect to said first mentioned member whereby rotation of said first mentioned member relative to the other of said members causes relative transverse movement between said members, an elongated locking pin carried by one of said members and extending perpendicularly to the axis of rotation of said first mentioned member, and bodily movable relative to said first member and in a plane normal to the axis of rotation of said first member into engagement with a contact blade positioned in

one of said recesses in response to rotation of said first member of insulating material.

2. In a plug receptacle, a housing, a plug rotatably mounted in said housing, said plug having spaced axially extending openings formed therein for the reception of the contact blades of an attachment plug cap, an elongated locking member rotatably mounted in said housing and extending perpendicularly to the axis of rotation of said plug and a driving connection between said plug and said locking member for rotating said locking member in response to rotation of said plug and permitting said locking member to move bodily relative to said plug and in a direction transverse to the axis of said plug into engagement with a contact blade positioned in one of said openings in response to rotation of said plug.

3. In a plug receptacle, a housing recessed to receive the contact blades of an attachment plug cap, a member of insulating material rotatably mounted in said housing, a locking pin mounted in said housing and extending in a plane perpendicular to the axis of rotation of said member of insulating material, said locking pin having an end flush with an outer side wall of said member of insulating material when said member is in one position, and a driving connection between said member and said locking pin for rotating said pin with said member, the axes of rotation of said member and said pin being eccentrically located whereby said end of said locking pin moves beyond said outer side wall into locking engagement with a contact blade received in said housing when said member is rotated to another position.

4. In a plug receptacle, a receptacle body recessed from one face to receive the contact blades of an attachment plug cap, an actuating member mounted in said body for rotation about an axis substantially perpendicular to said one face, a locking member rotatably mounted in said housing, and a driving connection between said actuating member and said locking member, the axes of rotation of said actuating member and said locking member being spaced apart transversely whereby rotation of said actuating member is effective to move said locking member transversely with respect to said actuating member and into engagement with a contact blade received in said body.

5. In a plug receptacle, a housing, a rotatable actuating member of insulating material mounted in said housing, said actuating member having openings formed therein for the reception of the contact blades of an attachment plug cap, locking means mounted in said housing for rotation about an axis parallel to the axis of rotation of said actuating member of insulating material, and means on said actuating member for engaging said locking member to transmit rotary motion therebetween, the axes of rotation of said member and said locking means being spaced apart whereby rotation of said actuating member causes relative transverse movement between said locking means and said actuating member and said locking means is moved into engagement with a contact blade positioned in one of said recesses.

6. In a plug receptacle, a housing of insulating material, a plug of insulating material rotatably mounted in said housing, said plug having a pair of recesses formed therein for the reception of the spaced contact blades of an attachment plug cap, a substantially L-shaped pin having one arm journaled in the floor of said body, and means on said plug for engaging the other arm of said L-shaped pin to rotate said pin in response to rotation of said plug and effective upon rotation of said plug to move said pin relative to said plug into interlocking engagement with a contact blade positioned in one of said recesses.

7. In a plug receptacle, a housing of insulating material, an actuating member of insulating material rotatably mounted in said housing, said actuating member having recesses formed therein for the reception of the contact blades of an attachment plug cap, a boss formed on the floor of said housing, an L-shaped pin having one arm journaled in said boss for rotation about an axis parallel to the axis of rotation of said plug, depending ribs on the lower face of said plug for engaging the other arm of said L-shaped pin for rotating said pin when said plug is rotated, the axes of rotation of said pin and plug being spaced apart whereby rotation of said plug causes relative movement between said pin and said plug.

8. In a plug receptacle, a housing, an actuating member of insulating material rotatably mounted in said housing and having a tapered groove on the lower face thereof, and locking means pivotally mounted in said housing with at least a portion thereof positioned in said groove and adapted to be rotated by rotation of said member, the axes of said member and said locking means being spaced apart transversely whereby rotation of said member causes relative transverse movement between said member and said locking means, said groove being substantially the width of said locking means at one edge of said member to prevent relative circumferential movement between said member and said locking means.

9. In a plug receptacle, a receptacle body recessed from one face thereof, a boss formed on the floor of said body, a cover for said housing having an opening therein, a plug of insulating material rotatably mounted in said receptacle body with one end in engagement with said boss and the other end journaled in said opening, said insulating plug having recesses formed on the outer surface thereof for the reception of the contact blades of an attachment plug cap, a locking member pivotally mounted on the face of said boss and extending along the lower face of said insulating plug, spaced projections on the lower face of said plug for engaging said locking member and effective when said insulating plug is rotated to rotate said locking member, the axes of rotation of said locking member and said plug being spaced apart whereby rotation of said plug moves said locking member transversely with respect to said plug and into locking engagement with a contact blade positioned in one of said recesses.

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