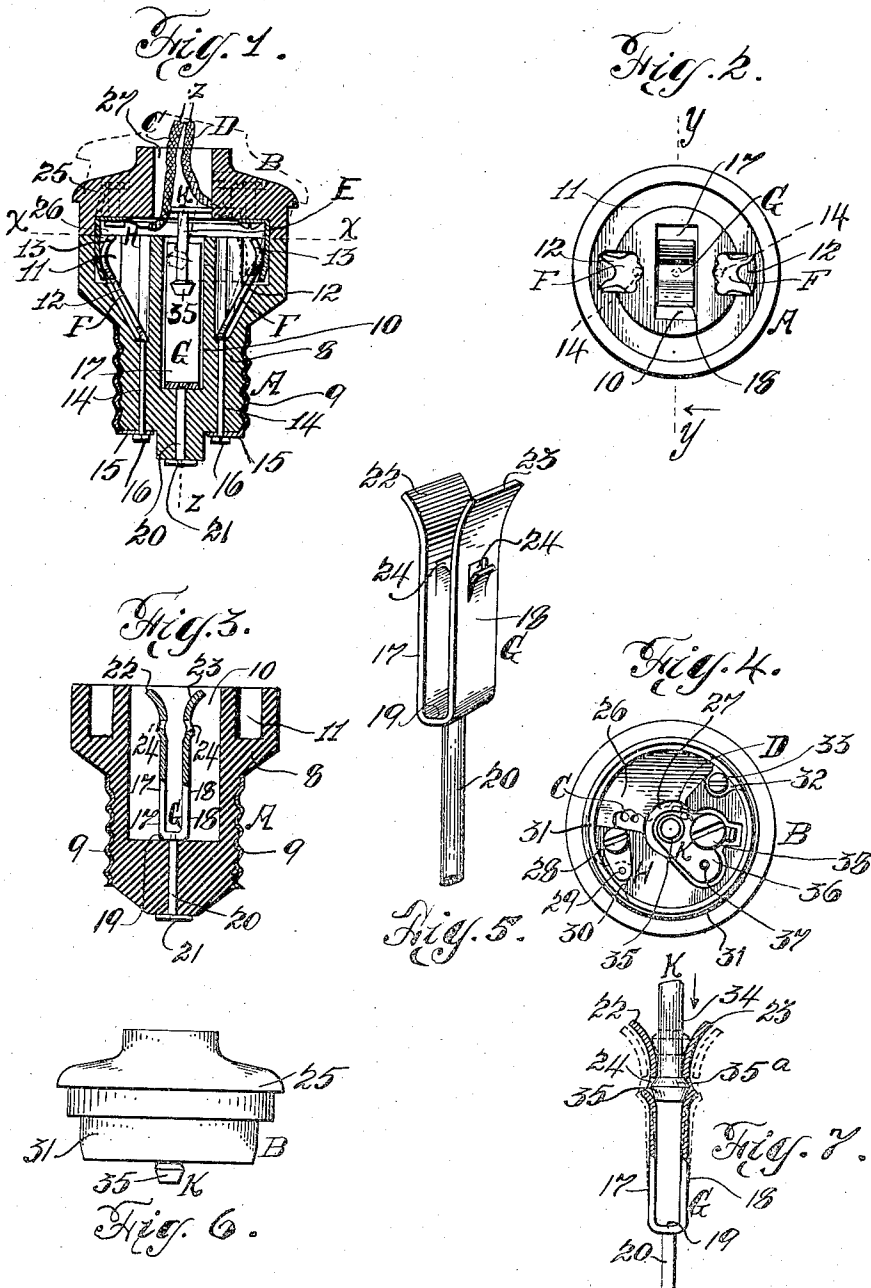


C. J. KLEIN.
ATTACHMENT PLUG.
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935,523.

Patented Sept. 28, 1909.



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UNITED STATES PATENT OFFICE.

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ATTACHMENT-PLUG.

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To all whom it may concern:

Be it known that I, CHARLES JULIUS KLEIN, a citizen of the United States, residing in the borough of Manhattan, in the city, county, and State of New York, have invented certain new and useful Improvements in Attachment-Plugs, of which the following is a specification.

This invention relates to attachment plugs adapted for use in connection with the extension of electrical circuits, and whereby incandescent lamps and other current-consuming devices and apparatus may be readily connected and disconnected with a source of electrical supply.

The invention has for its object to provide an improved attachment plug, the members of which are capable of simple and convenient connection and disconnection, and in the use of which increased protection is afforded for the fixture with which the attachment plug is connected and for the apparatus which is connected with such fixture through the agency of such attachment plug, and which attachment plug shall be superior in point of simplicity and inexpensiveness of construction and in general efficiency and serviceability.

The invention in its preferred form comprises two members which are both swivelly and detachably connected, and connection means whereby said members are so connected, said connection means being so formed and so arranged with relation to the two members that said members may be separated one from the other by a straight-away pull or by the application of pressure to the members or to one of the members which is effective to cause the bending apart or angular separation of the same, all as hereinafter specifically described: The members of the attachment plug comprise jointly circuit members and electrical connections through which an electrical circuit may be extended by means of the attachment plug.

In the drawing:—Figure 1 is a central longitudinal sectional view of the attachment plug embodying the invention, such attachment plug being of a type specifically adapted for connection with an incandescent lamp socket, not shown; Fig. 2 is a top plan view of the inner body member of the same; Fig. 3 is a central longitudinal sectional view of the same, taken upon the line $y-y$, Fig. 2, at

right angles to the plane of the section of Fig. 1, and looking in the direction of the appended arrow; Fig. 4 is a bottom plan view of the outer body member; Fig. 5 is a detail perspective view of a portion of one of the circuit members of the device; Fig. 6 is a side view of the outer body member of the device; and, Fig. 7 is an enlarged detail side view, partly in section, of parts of one of the circuit members and its allied electrical connections, same being shown in attached position.

Corresponding parts in all the figures are denoted by the same reference characters.

Referring with particularity to the drawing, the improved attachment plug comprises the two members A and B respectively, of which the member A is the inner body member and the member B is the outer body member, the member A being formed, in the specific disclosure of the drawing, for direct connection with an incandescent lamp socket, and the member B being adapted for connection with the current-consuming device or apparatus, the latter member being shown with two conductors, C and D respectively. The two members which are separable upon the line $x-x$, Fig. 1, are separably held together and swivelly attached by connection means E. By said connection means E the members are held together swivelly, and such connection means E permit the members to be relatively separated by the application of force to urge them apart in a direction coincident with the common longitudinal axis of the two members, indicated by the line $z-z$, Fig. 1; or by the application of force to bend the members apart or cause the separation of one member from the other in a path at an angle to the common longitudinal axis designated by the line $z-z$, Fig. 1. The connection means E are located adjacent to the line of junction $x-x$ of the two members, being preferably comprised within the circuit members of the member A and their allied electrical connections.

F and G designate the circuit members of the member A, and H and K designate electrical connections carried by the member B, and which are respectively associated with the circuit members F and G. The conductors C and D are respectively connected with the electrical connections H and K.

A preferred form of the construction, op-

erative connection and relative arrangement of parts and members of an attachment plug comprising the invention, as illustrated in the accompanying drawing, is as follows:—

5 The body member A comprises a generally cylindrical body portion 8 which is provided with the customary threaded metallic shell 9 formed for connection with the customary threaded socket (not shown). Said body
10 portion 8 is provided with a central longitudinally extending chamber 10, and with an annular chamber 11, both of which chambers open outwardly or toward the member B. The circuit member F, or, as shown in the
15 drawing, the two circuit members F, are located within the chamber 11, and the circuit member G is located within the chamber 10. Each of the circuit members F comprises a spring prong 12, the outer or free end of
20 which is slightly inwardly curved, as at 13, and the inner end portion of which is projected through a suitable bore in the inner portion of the body portion 8, as at 14, and secured to an ear 15 formed upon the shell
25 9, as at 16. Each of the prongs 12 and the extended portion 14 thereof is of integral construction in entirety, and may be conveniently stamped up from a blank of metallic wire of suitable diameter and electrical con-
30 ductivity.

The circuit member G comprises two spaced spring prongs, 17 and 18 respectively, which are located within the chamber 10 in the body portion 8, the inner end portions of
35 the same being joined as at 19, with a shank or pin 20, which extends axially through the inner end portion of the body portion 8 and terminates in the contact head 21. The prongs 17 and 18 and the pin or shank 20 are
40 of suitable electrically conductive material. The outer end portions 22 and 23 respectively, of the prongs 17 and 18, are bent apart relatively, and adjacent to such bent apart portions said prongs are indented or
45 slitted, as at 24, for the purpose hereinafter specified. Such bent apart and slitted portions of the prongs 17 and 18 are located slightly within the outermost portion of the inner body member A. The chamber 10 and
50 the prongs 17 and 18 are of such dimensions and of such relative arrangement that said prongs may be freely bent apart to a material extent within the chamber 10.

The body member B comprises a body
55 portion 25 which, when fitted to the body member A, serves as a cap for the same. Such body portion 25, which is substantially cylindrical in form, is provided with a lateral interior chamber 26, which opens out-
60 wardly of the member 25 through a passage or perforation 27, which latter accommodates the conductors C and D and permits their leading-in to the electrical connections H and K.

65 The electrical connections H comprise a

binding screw 28 located within the interior chamber 26 of the body portion 25, and connected by a pin 29 with an ear 30 formed upon a metallic annulus 31, which projects beyond the inner portion of the member B, and is arranged to enter the annular chamber 11 of the member A and to engage with the circuit members F exteriorly of the same, when the members A and B are brought together. The binding screw 28 and the annulus 31 are
75 of suitable electrically conductive material. The annulus 31 is also provided with a further ear 32 arranged substantially diametrically opposite to the ear 30. A screw 33 passes through said ear 32 and into the
80 body portion 25 of the member B. The pin 29 likewise enters the body portion 25, and said pin 29 and said screw 33 hold the annulus 31 firmly in position.

The electrical connections K comprise a
85 metallic stud or post 34 provided with an enlarged head 35, formed for suitable engagement with the prongs 17 and 18 of the circuit member G, the face of said head being of such angular formation as to enable it to be firmly
90 seated within the cut-away or slitted portions 24 of the said prongs 17 and 18, and to have a temporary locking engagement with said prongs 17 and 18 in swivel connection. As will be seen, the head 35 is provided with a
95 tapering portion 35^a, which portion constitutes an extended locking area, the engagement of any portion of which with the slitted portions 24 of the prongs 17 and 18 constitutes a positive locking engagement. The
100 circuit member G extends substantially longitudinally axially of the member A, and the stud or post 34 projects from the member B in such direction that when the member B and the member A are brought together op-
105 eratively said stud or post 34 will enter the space between the bent apart portions 22 and 23 of the prongs 17 and 18, in a path coincident with the longitudinal axis of the member A. The stud or post 34 thus lies within
110 the longitudinal axis of the member B and an extension thereof. The stud or post 34 is fixed to a metallic bracket 36 arranged within the passage 27, and connected with the body portion 25 of the member B by a pin
115 37 which holds the entirety in place. The bracket 36 is provided with a binding screw 38 with which the conductor D is connected, the conductor C being connected with the binding screw 28. It will be noted that
120 while the stud or post 34 lies within the longitudinal axis of the member B and an extension thereof, it is supported at one side of said axis by the bracket 36. It is necessarily
125 so supported to register with the circuit member G. The chamber 26, while communicating with the passage or perforation 27, which latter is formed around the longitudinal axis of the member B, is nevertheless at one side
130 of the member A, the conductors C and D

passing through the passage 27 and being spread apart in the chamber 26 for connection respectively with the binding screws 28 and 38. This arrangement of the said chamber and passage gives great convenience in leading-in the conductors and tying the same or spreading the same within the chamber 26.

Both of the body portions 9 and 25 are formed of porcelain or other suitable insulating material.

The annulus 31 is somewhat curved transversely, as most clearly shown in Figs. 1 and 6, to more closely fit the spring prongs 12, and so as to maintain a tight and close connection of such annulus and said spring prongs in locking engagement.

It will be seen from the above that the conductor C is electrically connected with the circuit members F through the binding screw 28 and the annulus 31; and that the conductor D is electrically connected with the circuit member G through the binding screw 38, the bracket 36, and the stud or post 34 and the head 35 thereof. The head 35 is of such dimension as to fit freely within the chamber 10, and to cause a slight separation of the prongs 17 and 18 when said head is introduced between the bent apart portions 22 and 23 of the prongs 17 and 18.

It will be noted that the spring quality of the prongs 12 constituting the circuit members F, as well as the spring quality of the prongs 17 and 18 constituting the circuit member G, cause a positive locking engagement of said circuit members F with the electrical connections H and of the circuit member G with the electrical connections K; but that such locking engagement permits of a swivel connection between the two members, and also permits of ready disconnection or separation of the two members A and B upon the application of properly applied force or pressure.

The method of use and advantages of the improvements herein described will be readily understood from the foregoing description taken in connection with the accompanying drawing and the following statement:—When the conductors C and D have been properly lead through the passage 27 in the body portion 25, of the member B, and connected respectively with the binding screws 28 and 38, of the respective electrical connections H and K, the electric circuit in connection with which said conductors are installed may be readily extended through the circuit members F and G of the member A by bringing the member B to bear upon the member A in proper registration, causing the electrical connections K to connect with the circuit member G and the electrical connections H to connect with the circuit members F. The annulus 31 surrounds and binds tightly upon the spring prongs 12,

and the head 35 of the stud or post 34 slightly forces apart and binds tightly upon and between the spring prongs 17 and 18; the annulus 31 and prongs 12 and the head 35 and prongs 17 and 18 thus constituting the connection means E. The angular formation of the head 35 causes a positive temporary locking engagement of the same with the slitted portions 24 of the prongs 17 and 18. It will be noted that the connection means E, constituted as last described, are arranged in proximity to the junction line of the members A and B. Both of the chambers 10 and 11 in the body portion 8 are of such dimensions as to permit material flexion of the spring prongs 12 and the spring prongs 17 and 18 within the respective chambers. From the formation and relative arrangement of parts as last specified it results that the members A and B may readily be separated not only by a "straight-away pull" in a direction coincident with their longitudinal axes; but that the members A and B may be "bent" apart, as shown in dotted lines in Fig. 1. For instance, with the member A installed in a fixture, lateral pressure may be applied to the member B so as to cause the same to separate from the member A in a direction of movement at an angle with the longitudinal axes of the members A and B. In such "bending apart" of the two members, the chambers 10 and 11 accommodate fully the movements of the annulus 31 and the stud or post 34, as well as of the prongs 12 and the prongs 17 and 18. These features of improvement in the construction of the connection means E are of high advantage in a device of the character under consideration, for in the use of such features of improvements any blow directed laterally against the member B or the conductors C and D will cause disconnection of the members A and B instead of injury to such conductors, such members A and B, the fixture with which the member A is connected and the device supplied with current by the conductors C and D. In attachment plugs in which separation of the members is only permitted by a "straight-away" pull or strain upon the members or either of the same, there is no obviating the damages above referred to to the installation, and such damages are frequent in installations in which the conductors are extended across rooms or considerable portions of the same. The swiveling of the member B upon the member A through the agency of the connection means E permits relative rotation of the members A and B. The member A may therefore be screwed into and out of its fixture without twisting or damaging the conductors, and the conductors and the device or apparatus supplied thereby may be shifted in position to cause revolution of the con-

ductors without changing the position of the member A. This flexible connection between the current-consuming device and the connection plug and its fixture effectually
 5 conserves the best working conditions and the prevention of injury to the conductors.

I do not desire to be understood as limiting myself to the specific construction, relative arrangement and connection of parts
 10 and members herein described, but reserve the right to vary the same in adapting the improvements to varying conditions of use without departing from the spirit of the invention or the terms of the following claims.
 15 Having thus described my invention, I claim and desire to secure by Letters Patent:—

1. An improved attachment plug comprising two separably and swivelly operatively
 20 connected body members, each provided with means for maintaining electrical circuit connections said means permitting both a straight and angular separation of the body members.

2. An improved attachment plug, comprising two separably and swivelly operatively connected body members jointly provided with means for maintaining electrical
 30 circuit conditions, and connection means detachably uniting said body members and enabling the same to be angularly separated, said connection means being comprised within said means for maintaining electrical circuit conditions.

3. An improved attachment plug, comprising two separably operatively connected body members jointly provided with means for maintaining electrical circuit conditions,
 40 and connection means detachably uniting said body members and enabling the same to be angularly separated.

4. An improved attachment plug, comprising two body members, and connection means detachably uniting said body mem-
 45 bers and enabling the same to be swivelly operatively connected and angularly separated.

5. An improved attachment plug, comprising two body members jointly provided with means for maintaining electrical circuit conditions, and connection means detachably uniting said body members and enabling the same to be swivelly operatively
 50 connected and angularly separated.

6. An improved attachment plug, comprising two body members separably and swivelly operatively connected, one of said body members being provided with circuit
 60 members, and the other of said body members being provided with electrical connections respectively adapted for electrical contact with said circuit members, and connection means detachably uniting said body
 65 members and enabling angular separation of the same.

7. An improved attachment plug, comprising two body members, and connection means detachably and swivelly operatively connecting said body members and enabling
 70 said body members to be separated by the movement of one of said body members in a direction at an angle with the longitudinal axes of both of said members.

8. An improved attachment plug, comprising two body members, and connection
 75 means detachably uniting said body members and comprising spring prongs carried by one of said members and engaging with the other of said members, and enabling said members to be angularly separated. 80

9. An improved attachment plug, comprising two body members having coinciding longitudinal axes; and connection means whereby said members are detachably and
 85 swivelly connected, and comprising spring prongs carried by one of said members and a headed stud carried by the other of said members, and enabling said members to be separated by the movement of one of said
 90 members in a direction at an angle with the longitudinal axes of both said members.

10. An improved attachment plug, comprising two body members having coinciding longitudinal axes, and connection means swivelly and detachably uniting said body
 95 members; said connection means comprising a plurality of spring prongs carried by one of said members, and an annulus and a headed stud carried by the other of said members and arranged for engagement re-
 100 spectively with said spring prongs, and enabling said members to be separated by the movement of one of said members in a direction at an angle to the longitudinal axes of both of said members. 105

11. An improved attachment plug, comprising two body members, and connection means swivelly and detachably uniting said body members; said connection means comprising a spring prong carried by one of
 110 said members, and a stud carried by the other of said members and provided with a head having a tapering portion, said spring prong being provided with a notched portion wherewith said tapering portion of said
 115 head is engaged to lock said body members together.

12. An improved attachment plug, comprising two body members, and connection means detachably uniting said body mem-
 120 bers; said connection means comprising a spring prong carried by one of said members, and a headed stud carried by the other of said members, said spring prong being provided with a notched portion, and said
 125 headed stud being provided with an extended locking area for engagement with said notched portion of said spring prong.

13. An improved attachment plug, comprising two body members, and connection 130

means detachably uniting said body members; said connection means comprising a notched spring prong carried by one of said members adjacent to the longitudinal axis thereof, and a headed stud carried by the other of said body members in the longitudinal axis thereof; said body member carrying said headed stud being provided with a passage surrounding the longitudinal axis thereof, and the same body member being provided with a chamber communicating with said passage.

14. An improved attachment plug, comprising two body members, and connection means detachably uniting the same and arranged in coincidence with the longitudinal axes of said body members; one of said body members being provided with a passage surrounding the longitudinal axis thereof, and the same said body member being provided with a chamber communicating with said passage.

15. An improved attachment plug, comprising two body members, and connection means detachably and swivelly uniting the same and arranged in coincidence with the longitudinal axes of said body members; one of said body members being provided with a passage surrounding the longitudinal axis thereof, and the same said body member being provided with a chamber communicating with said passage.

16. An improved attachment plug, comprising two body members, and connection means detachably uniting said body members; said connection means embodying a spring prong carried by one of the members and provided with a curved operative end portion and an inner end portion projected through the said body member and constituting a circuit member; and an annulus carried by the other body member and engaging with said spring prong, said annulus constituting an electrical connection.

17. An attachment-plug comprising a body portion, a terminal-carrying portion and means engaging with the terminal-carrying portion for enabling the same to be swiveled upon and detached from said body portion.

18. An attachment-plug comprising a body portion, a terminal-carrying portion and spring connections between said body portion and terminal-carrying portion for the

terminal-carrying portion to be swiveled upon and detached from said body portion.

19. An attachment-plug comprising a body portion, a terminal-carrying portion and spring-clips within said body portion engaging with said terminal-carrying portion for said carrying portion to be swiveled upon and detached from said body portion.

20. An attachment-plug comprising a body portion, a terminal-carrying portion having rounded portions thereon, and spring-clips within said body portion engaging with said rounded portions for said carrying portion to be swiveled upon and detached from said body portion.

21. An improved attachment plug comprising two separably operatively connected body members, each provided with means for maintaining electrical circuit connections, said means permitting either a straight or an angular separation of the body members.

22. A separable electric connector comprising a one-piece base of insulating material provided at one end with annular recesses, contact clips or jaws located in said recesses, and center and side contacts at the other end of the base electrically connected to said clips or jaws.

23. A separable electric connector comprising a one-piece base of insulating material provided at one end with annular recesses, contact clips or jaws located in said recesses, a shell contact surrounding the other end of said base and connected to one of said clips or jaws and a center contact connected to the other clip or jaw.

24. A separable electric connector comprising a one-piece base of insulating material provided in the upper end with annular recesses, contact clips or jaws located in said recesses with their outer ends below the end surface of the base, a shell contact mounted upon and surrounding the lower end of said base and connected to one of said clips or jaws, and a center contact electrically connected to the other clip or jaw.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES JULIUS KLEIN.

Witnesses:

BENJAMIN B. HOFFMAN,
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