April 13, 1948. L. FRANK 2,439,462

ELECTRIC PLUG AND SOCKET LATCH

Filed Sept. 20, 1943

FIG. 1.

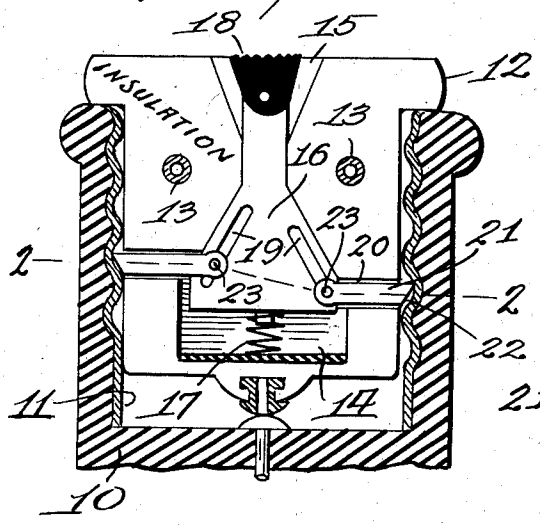


FIG. 2.

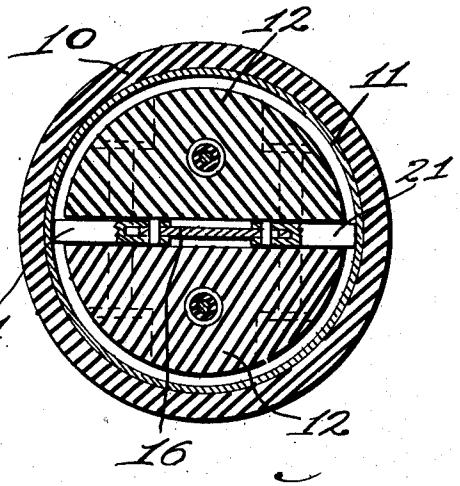


FIG. 3.

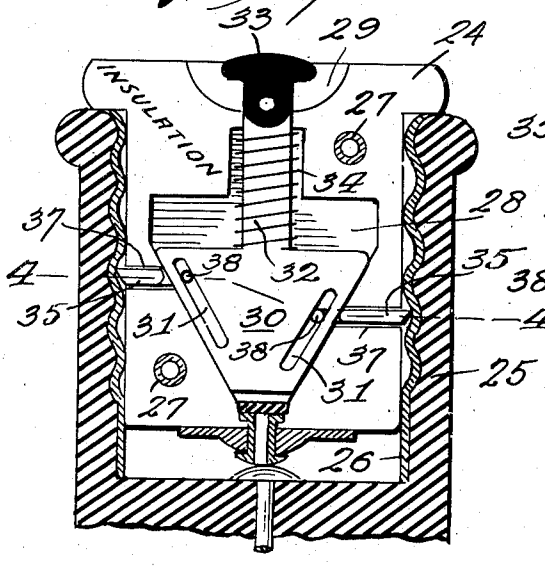


FIG. 4.

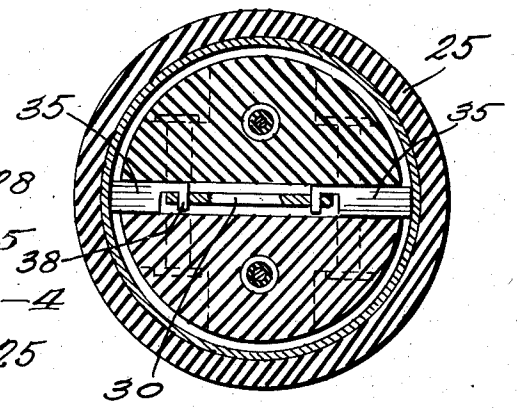
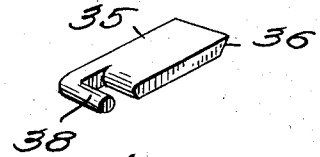


FIG 5.



INVENTOR.
LOUIS FRANK.
BY
Martin P. Smith
ATTY.

Patented Apr. 13, 1948

2,439,462

UNITED STATES PATENT OFFICE

2,439,462

ELECTRIC PLUG AND SOCKET LATCH

Louis Frank, Fellows, Calif.

Application September 20, 1943, Serial No. 503,043

3 Claims. (Cl. 173—360)

1

My invention relates generally to electric plugs and, particularly, to means for latching the plugs in their sockets, and the principal object of my invention is to provide electric plugs with simple and effective means for securing same in internally threaded sockets, and which securing means is capable of being readily manipulated in order that the plug may be withdrawn from the socket.

A further object of my invention is to provide latching and securing means for plugs which are devoid of the external threads, thus enabling the plugs to be inserted in and removed from the sockets without the rotary screwing actions which attend the insertion of threaded plugs into the threaded sockets and the removal of such plugs from said sockets.

With the foregoing and other objects in view, my invention consists in certain novel features of construction and arrangement of parts which will be hereinafter more fully described and claimed, and illustrated in the accompanying drawings, in which:

Fig. 1 is a vertical section taken through the center of an electric plug and the socket in which said plug is seated and which plug is equipped with my improved latching means.

Fig. 2 is a horizontal section taken on the line 2—2 of Fig. 1.

Fig. 3 is a vertical section similar to Fig. 1, and showing a modified form of the latching means.

Fig. 4 is a horizontal section taken on the line 4—4 of Fig. 3.

Fig. 5 is a perspective view of one of the latching dogs used in the plug securing means illustrated in Figs. 3 and 4.

Referring by numerals to the accompanying drawings, and, particularly, to the construction illustrated in Figs. 1 and 2, 10 designates a conventional electric socket within which is located a metal shell 11 having a thread pressed therein for the reception of the thread on a conventional electric plug.

The plug in accordance with my invention comprises a cylindrical body divided on a medial longitudinal plane, thus forming two identical parts 12 which are permanently connected to each other in any suitable manner, preferably by tubular rivets 13. Formed in the inner faces of the lower portions of the plug body member 12 are coincident recesses which provide a narrow chamber 14, said chamber extending upwardly through the central portion of the plug body

2

and communicating with a narrow chamber 15 in the top of the plug.

Arranged for spreading movement in the chambers 14 and 15 is a plate 16 and positioned between the lower edge thereof and the bottom of chamber 14 is an expansive coil spring 17 which normally maintains the plate in its upper limit of movement. Carried by the upper end of plate 16, and located in chamber 15, is a head or button 18 of insulating material.

Formed in the lower portion of plate 16 on opposite sides of the center thereof are slots 19 which converge upwardly. Arranged for spreading movement in horizontally disposed openings 20 which are formed in the inner faces of the plug body parts 12, are horizontally disposed dogs or latching fingers 21 having bevelled outer ends 22 for engagement in the channel portions of the thread that is formed in the metal lining 11 of the socket. In order to conform with the pitch of the thread in the socket, the latching dogs or fingers 21 occupy different elevations.

The inner ends of the dogs or fingers 21 are slotted for the accommodation of the plate 16 and seated in said dogs to the sides of the slots therein are pins 23 which pass through the slots 19.

Under normal conditions, the spring 17 maintains plate 16 at its upper limit of movement and thus the latching dogs or fingers 21 are in their projected positions. To insert the plug into a socket, it is only necessary to apply sufficient force to the outer end of said plug to move the body thereof into the socket and in so doing, the beveled outer ends 22 of the latching dogs will ride past the rib portion of the thread in said socket, and when said plug is inserted fully, the beveled ends of the dogs will project into the channel portion of the thread in the socket, thus securely latching the plug within said socket.

To remove the plug, it is only necessary to apply inward or downward pressure on button 18, thus moving plate 16 downwardly in the chamber 14 and the pins 23 travelling in the inclined slots 19 will act to draw the latching dogs into the plug so as to disengage their outer ends from the thread, thus enabling the plug to be readily withdrawn.

In the modified construction illustrated in Figs. 3, 4 and 5, the socket 25 is provided with a threaded lining 26, and the plug body is composed of two identical parts 24 united by tubular rivets or the like 27. Formed in the inner faces of the parts of the plug body are coincident re-

cesses which provide a chamber 28 and formed in the upper portions of the inner faces of the plug body members are coincident recesses which provide a chamber 29.

Arranged for spreading movement in chamber 28 is a plate 30 provided on opposite sides of its center with slots 31 which converge downwardly and projecting upwardly from the center of said plate is an arm 32 which projects into the chamber 29 and carries a head or button 33 of insulation.

Positioned on arm 32 between the upper end of plate 30 and a shoulder at the top of chamber 28 is an expansive coil spring 34. Latching dogs or fingers comprising plates 35 having beveled outer ends 36 are arranged for spreading movement in horizontally disposed openings 37 which are formed between the side portions of the inner faces of the plug body members 24 and the inner ends of said plate are provided with transverse pins 38 which pass through the inclined slots 31. These latching dogs or plates are located at different elevations in order that their outer ends may engage in the channel portions of the thread in the socket.

To insert this form of plug in the socket, the button 33 is engaged and pulled upwardly or outwardly a short distance, thus retracting the latching dogs or fingers 35 so that said plug may be inserted in the socket and upon release of the button 33, spring 34 will act to move plate 30 downwardly to its normal position, and thereby move the latching dogs outwardly so that their bevelled outer ends engage in the channel portion of the thread in lining 26, thus firmly securing the plug in position within said socket.

To withdraw the plug, it is only necessary to engage button 33 and pull plate 30 upward or outward a short distance, thus retracting the latching dogs and disengage their outer ends from the thread in said socket.

Thus it will be seen that I have provided an electric plug latch which is simple in construction, inexpensive of manufacture and very effective in performing the functions for which it is intended.

It will be understood that minor changes in the size, form and construction of the various parts of my improved electric plug latch may be made and substituted for those herein shown and described without departing from the spirit of the invention, the scope of which is set forth in the appended claims.

I claim as my invention:

1. The combination with an internally threaded electric socket of an electric contact plug adapted to be positioned in said socket, a member arranged for movement lengthwise within said plug, latching dogs arranged for radial movement at right angles to the axis thereof in said plug, said longitudinally movable member being provided with oppositely inclined slots, pins carried by the inner ends of said latching dogs which pins pass through said inclined slots and the outer end of which longitudinally movable member extends to and lies substantially flush with the outer face of said plug.

2. The combination as set forth in claim 1 and with means for yieldingly resisting the movement of said longitudinal movable member in one direction.

3. The combination as set forth in claim 1 and with means for yieldingly resisting the movement of said longitudinally movable member in one direction and a button of insulation mounted on the outer end of said longitudinally movable member.

LOUIS FRANK.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,119,864	Ovington et al.	Dec. 8, 1914
1,206,245	Powell	Nov. 28, 1916
1,298,623	Zeigler	Mar. 25, 1919
1,317,548	Casper	Sept. 30, 1919
1,387,814	Ten Bosch	Aug. 16, 1921
1,510,247	Smith	Sept. 30, 1924
1,552,346	Riley	Sept. 1, 1925
1,873,856	Wolfe	Aug. 23, 1932
2,031,914	Veysey et al.	Feb. 25, 1936

FOREIGN PATENTS

Number	Country	Date
621,241	Germany	Nov. 4, 1935