

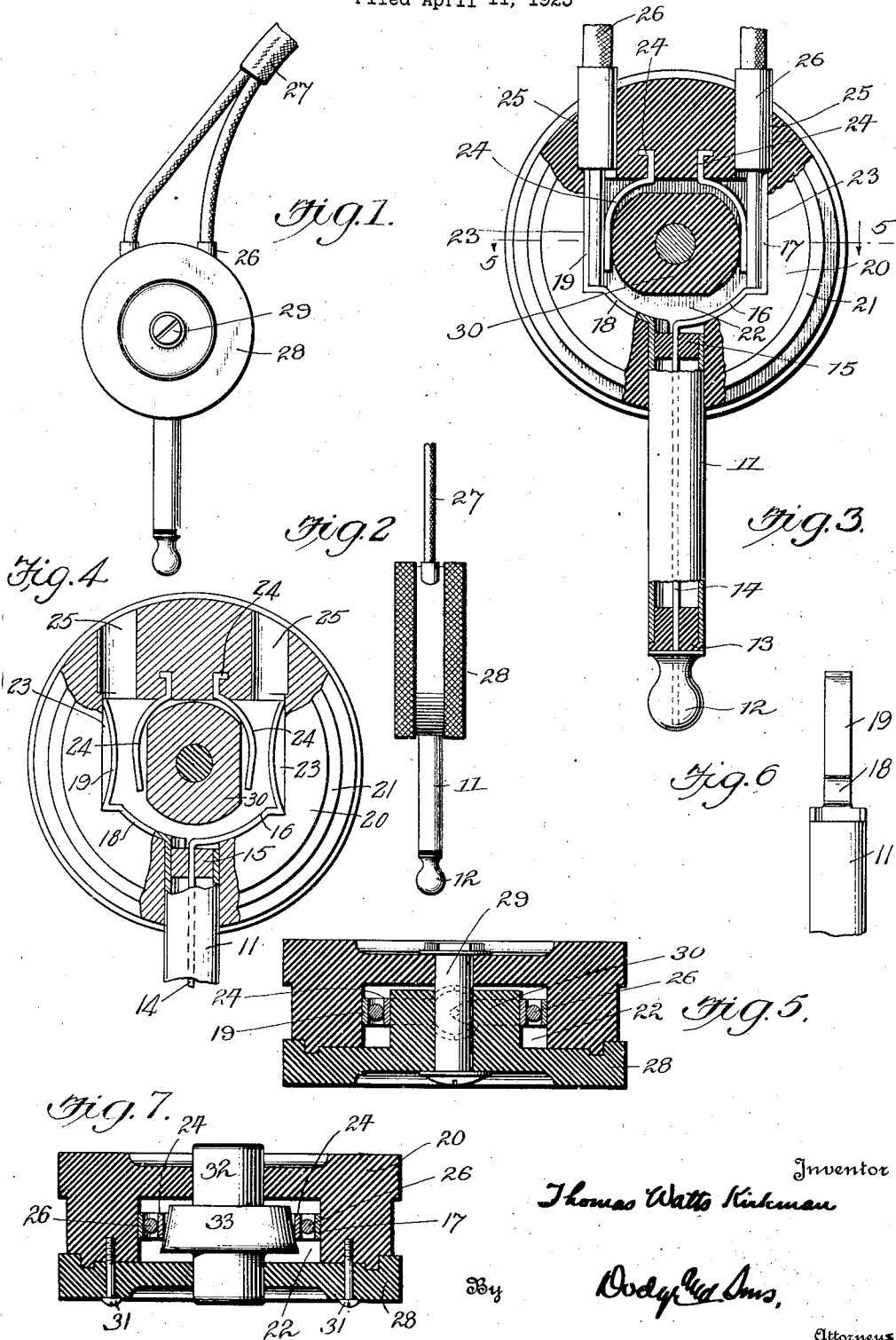
Oct. 18, 1927.

T. W. KIRKMAN.

1,645,650

ELECTRIC PLUG

Filed April 11, 1925



Inventor
Thomas Watts Kirkman

By
Dodge & Sons,

Attorneys

Patented Oct. 18, 1927.

1,645,650

UNITED STATES PATENT OFFICE.

THOMAS WATTS KIRKMAN, OF NEW YORK, N. Y.

ELECTRIC PLUG.

Application filed April 11, 1925. Serial No. 22,475.

This invention relates to electrical connections and particularly to a jack plug for use in telephony especially adapted for use with radio broadcast receiving sets.

5 In this field there is a demand for a jack plug to which the terminal tips of head phones or loud speakers may be quickly and easily attached, and from which they may be as quickly removed. The invention provides a plug having cam-actuated clamping means which engage the terminals frictionally and which may be readily actuated to grip the terminals very tightly or to release them at will.

15 Preferred embodiments of the invention are illustrated in the accompanying drawing, in which

Fig. 1 is a side elevation of the complete plug with the cable attached;

20 Fig. 2 is an edge elevation of the same;

Fig. 3 is an enlarged view similar to Fig. 1, with the parts broken away to show the internal construction;

25 Fig. 4 is a view similar to Fig. 3, showing the parts in tip releasing position;

Fig. 5 is a section on the line 5—5 of Fig. 3;

Fig. 6 is a fragmentary view showing the construction of one of the contact members;

30 Fig. 7 is a view similar to Fig. 4 and illustrating a modified form of the device.

The contact elements of the plug consist, as is usual in the art, of a tubular sleeve 11 and a head 12 spaced apart by a bushing 13 which connects them mechanically, but which insulates them electrically from each other. The head 12 is carried on a tongue 14 which passes through the bushing 13 and fits tightly therein. Near the upper or rear end of the tubular sleeve 11 it is further sustained by an insulating bushing 15, and beyond this bushing it is formed with an off-set 16 and a normally bowed contact member 17 which appears straight in Fig. 3 because it is there shown as held under clamping pressure. The tubular sleeve 11 is similarly provided with an extension having an offset portion 18 like the off-set in the tongue 14 and terminating in a bowed contact member 19 like the contact member 17 and opposed thereto.

55 The upper or rear end of the tubular sleeve 11 is fixed in an insulating head 20. The exact mode of mounting is not material, but the preferred way is to mold the head 20 onto the sleeve 11 so that a close and per-

manent connection is assured. The head 20 is of generally circular contour and is provided with an annular guide member 21 which may conveniently take the form of an up-standing rib, as shown. At its middle the head 20 is formed with a recess 22 along the margins of which the off-sets 16 and 18 extend, the recess being so formed that the extremities of each of the bowed contact members 17 and 19 seat against straight supporting faces 23 with their intermediate portions bowed outward therefrom. Concentric with the guide 21 is a hole to receive a pivot connecting member for the combined cover and clamping cam hereafter described.

There are two resilient clamping members 24 which are mounted in the head 20 and which may conveniently be fixed therein during the molding operation. The free ends of the members 24 lie in opposed relation to the bowed contact members 17 and 19. Approximately aligned with the intervals between the clamping members 24 and their respective opposed contact members 17 and 19 are two apertures 25 formed in the head 20 through which the cord tips of a telephone cable 27 may be inserted.

A cover disc 28, also of generally circular contour, is mounted to turn on the head 20. It is held by means of a bolt 29 and is guided by a circular groove which receives the rib 21. The purpose of the rib 21 and the coating groove in the cover disc is to center the cover disc 28 on the head 20 independently of the bolt 29. Thus the bolt 29 merely holds the parts in assembled relation, the rib relieving the bolt of lateral stresses.

95 The cover disc 28 is likewise of insulating material and carries an integrally formed cam member 30 which projects into the recess 22 and is positioned between the resilient clamping members 24. It may be given any form suited to the accomplishment of its intended purpose, which is simultaneously to force the two clamping members 24 outward as the cover 28 is rotated on the head 20. In the form chosen for illustration (see Fig. 3) the cam is formed with two opposed flat surfaces, and between these, two curved surfaces of progressively varying radius. The cam is symmetrical with respect to a line so that it will clamp when turned in either direction.

110 When the flat surfaces are beneath the clamping members 24, these swing inward

because of their inherent resilience. In this position the cord tips may be readily inserted or withdrawn. After they have been inserted, the cover 28 is rotated in either
5 direction relatively to the head 20 so as to cam the clamping members 24 apart. This forces the clamping members 24 outward, pressing them against the cord tips 26 and clamping these tips in place. Under such
10 pressure, the bowed contact members 17 and 19 are flattened out. The purpose in bowing them is to give some resilience to the clamping action and to compensate for the wear of the cam 30 which may occur after
15 long continued use.

Obviously the clamping members 24 might be omitted, in which case the cam 30 would clamp directly against the cord tips 26. This construction is inferior for the reason that
20 the cam would soon be worn under the contact with the cord tips. The clamping members 24 afford a much larger area of contact with the cam and relieve it from the severely localized pressure to which it would otherwise be subjected.
25

A comparison of Figs. 3 and 4 will show that the contact members 17 are normally bowed, but that in the position of maximum clamping pressure they are entirely flattened
30 out.

While I prefer the use of a cam mounted on a rotary cover, some of the advantages of the invention can be secured with a slightly different construction, for example, that shown in Fig. 7. Here the cover disc
35 28 is fixedly mounted on the head 20 by means of screws 31, and the cam 30 is entirely omitted, as is the bolt 29. A plunger 32 is mounted to slide transversely through the head 20 and cover disc 28 and carries
40 within the recess 22 a tapered or conical cam member 33 which directly engages the resilient clamping members 24. By pushing the plunger 32 in one direction, the cam 33 forces the clamping members 24 apart to
45 clamp the cord tips 26. In such clamping position the cam is retained by friction. When the plunger 32 is pressed in the opposite direction, the clamping members 24 are released to free the cord tips 26.
50

The construction shown in Figs. 1 to 6 is preferred for the reason that the use of a rotary cam permits a little greater range of movement of the cam, and hence a more
55 gradual clamping action. Furthermore, this embodiment is subject to less risk of accidental release of the cord tips since there is substantially no tendency of the cap to rotate on the head under light impacts such
60 as are likely to occur in use.

While I have described the construction of the various parts in some detail, the invention obviously is capable of various mechanical expressions, and I do not imply any limitation to the specific construction except
65 to the extent specified in the claims.

What is claimed is:

1. In an electrical connecting plug, the combination of contacts; clamping means for connecting the terminals of an electric
70 cable in conducting relation with said contacts; a body housing said clamping means; a cover rotatably mounted on said body; and means serving to actuate said clamping means and operable by the rotation of said
75 cover.

2. In an electrical connecting plug, the combination of contacts; clamping means for connecting the ends of an electric cable in conducting relation with said contacts; a
80 body housing said clamping means; a cover rotatably mounted on said body; and a cam formed on said cover and arranged to clamp and release said terminals as said cover is rotated.
85

3. In a jack plug, the combination of a tip contact; a sleeve contact; a body on which said contacts are mounted; connectors mounted in opposed spaced relation within
90 said body and respectively connected with said tip and sleeve contacts; and a single cam movably mounted in said body between said connectors, and operable to clamp the inserted terminals of a conductor cable against said connectors.
95

4. In a jack plug, the combination of a tip contact; a sleeve contact; a body on which said contacts are mounted; connectors mounted in opposed spaced relation
100 within said body and respectively connected with said tip and sleeve contacts; and a single cam rotatably mounted in said body between said connectors and operable to clamp the inserted terminals of a conductor cable against said connectors.
105

5. In a jack plug, the combination of a tip contact; a sleeve contact; a two part body having a main portion and a cap portion rotatably mounted thereon, said contacts being mounted on said main portion;
110 two terminal clamps mounted in said main portion and electrically connected with respective contacts; and a cam rotatable by the rotation of said cap portion and mounted between said terminal clamps so as to operate the two simultaneously.
115

In testimony whereof I have signed my name to this specification.

THOMAS WATTS KIRKMAN.