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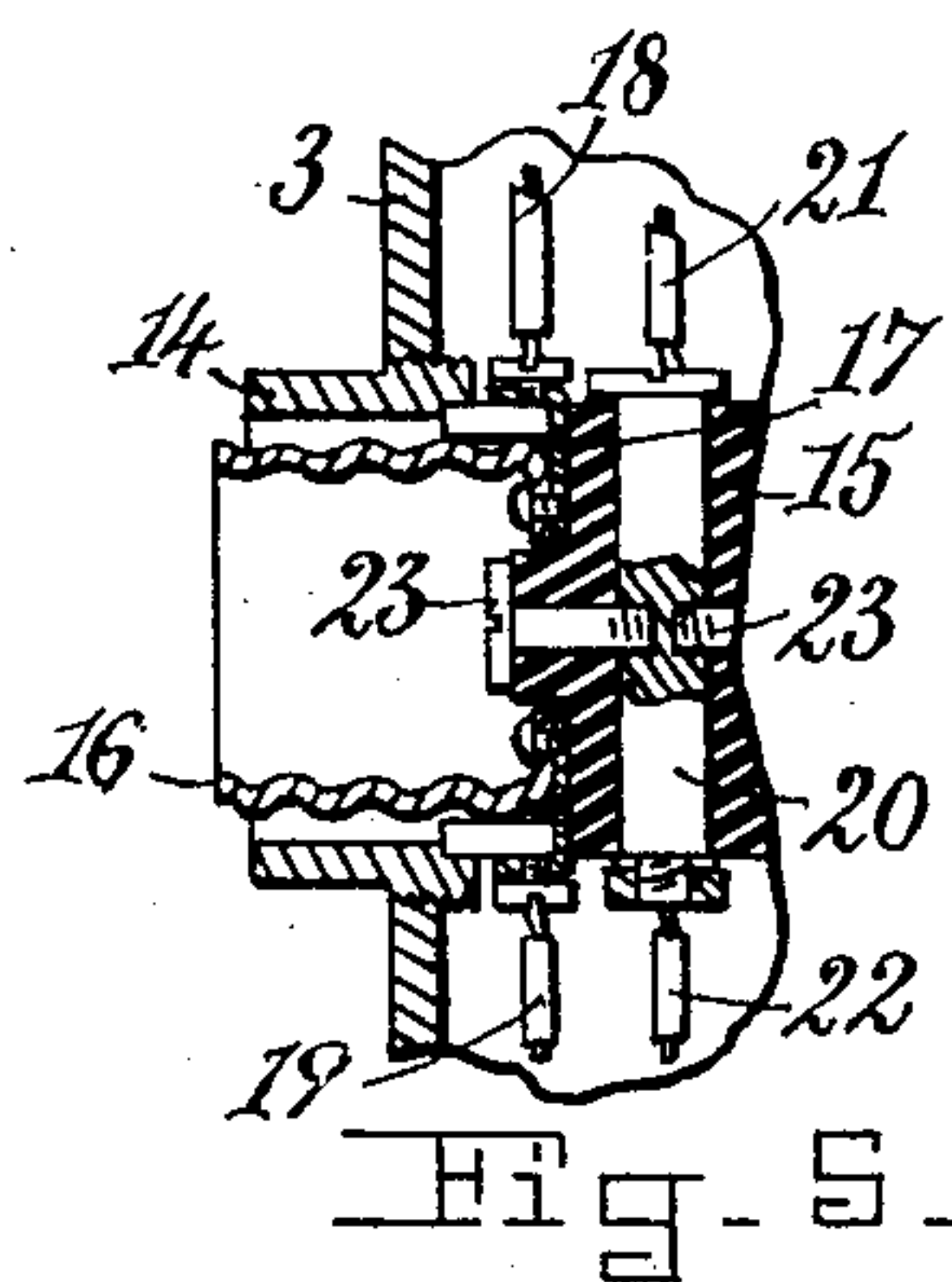
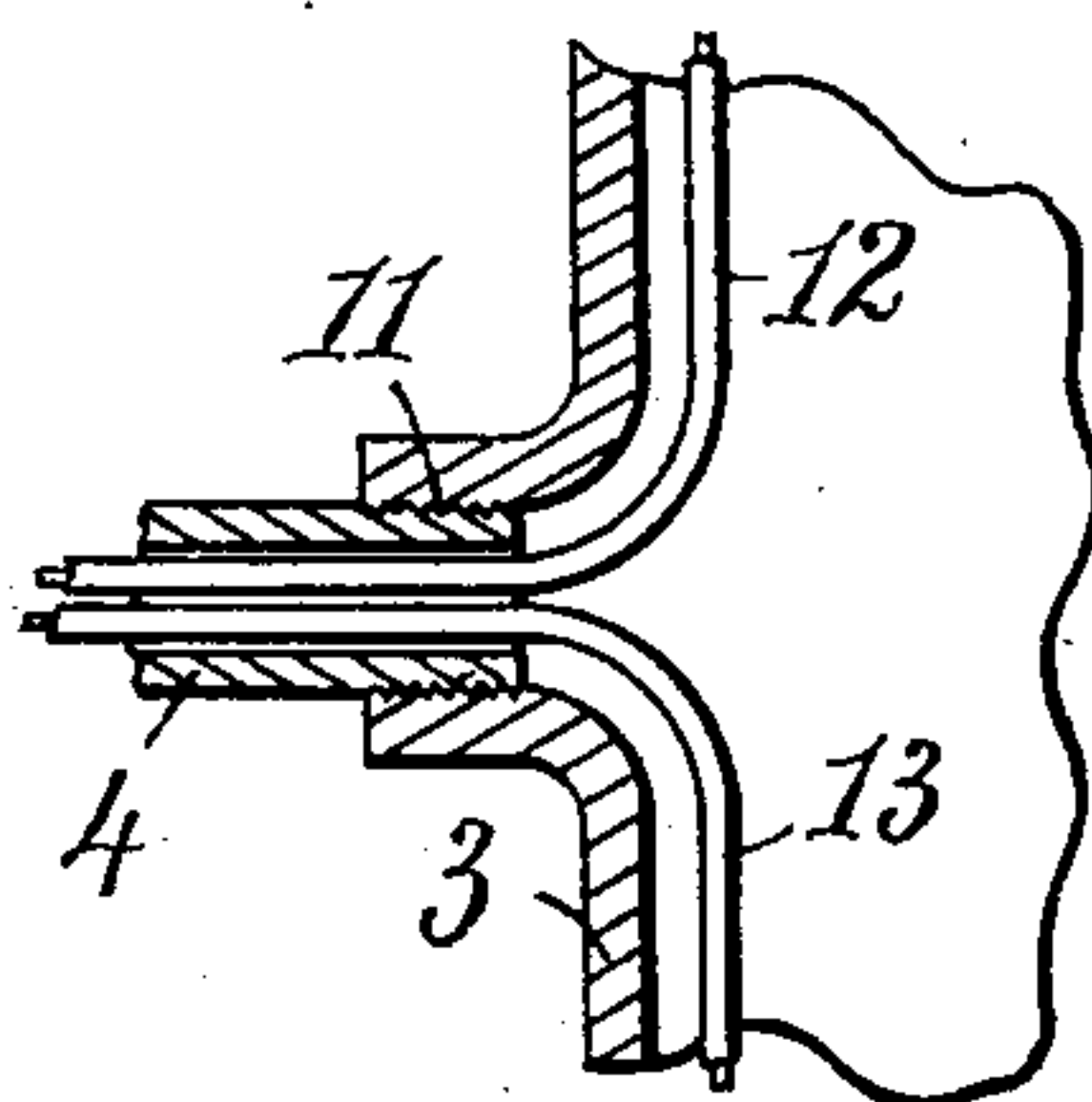
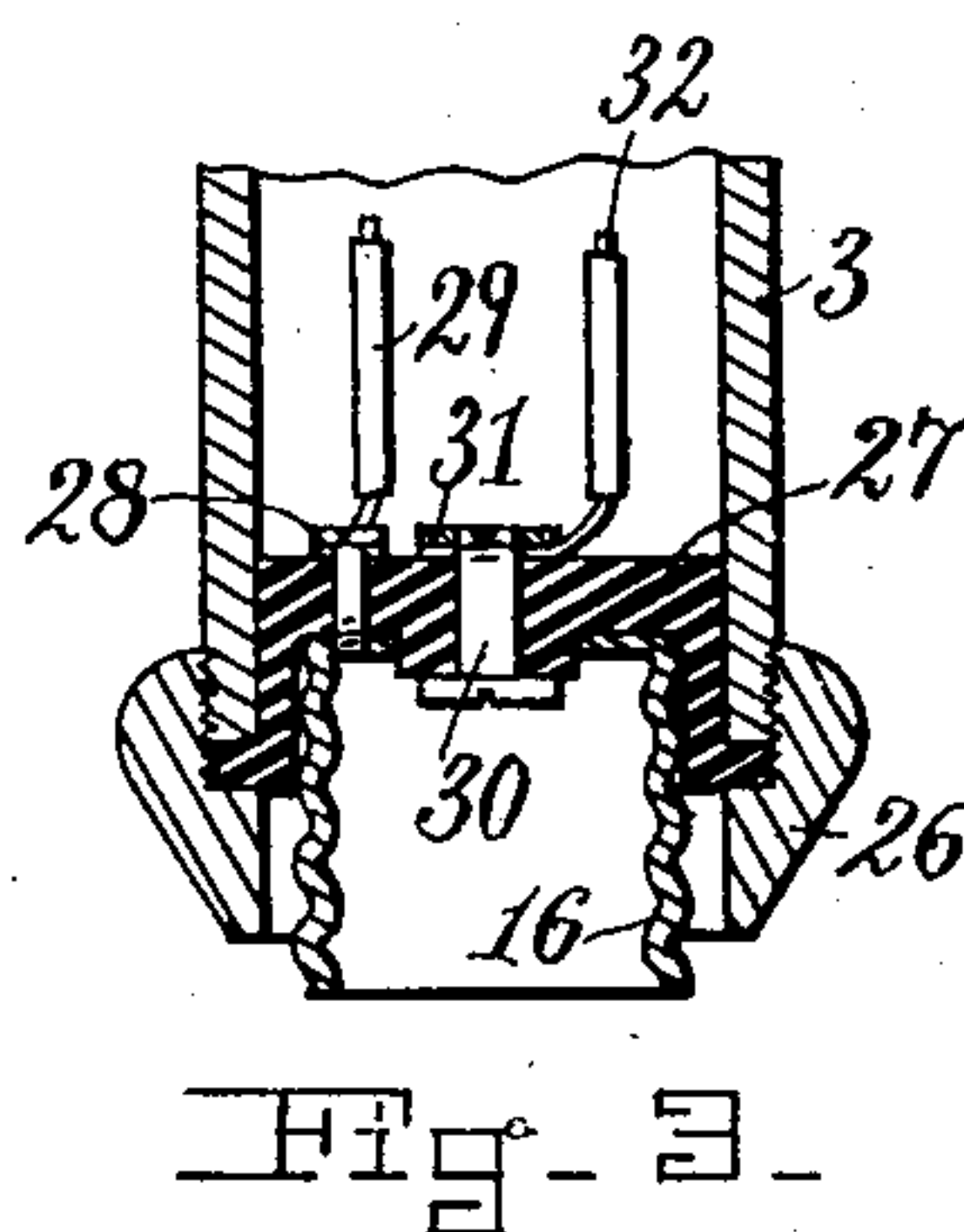
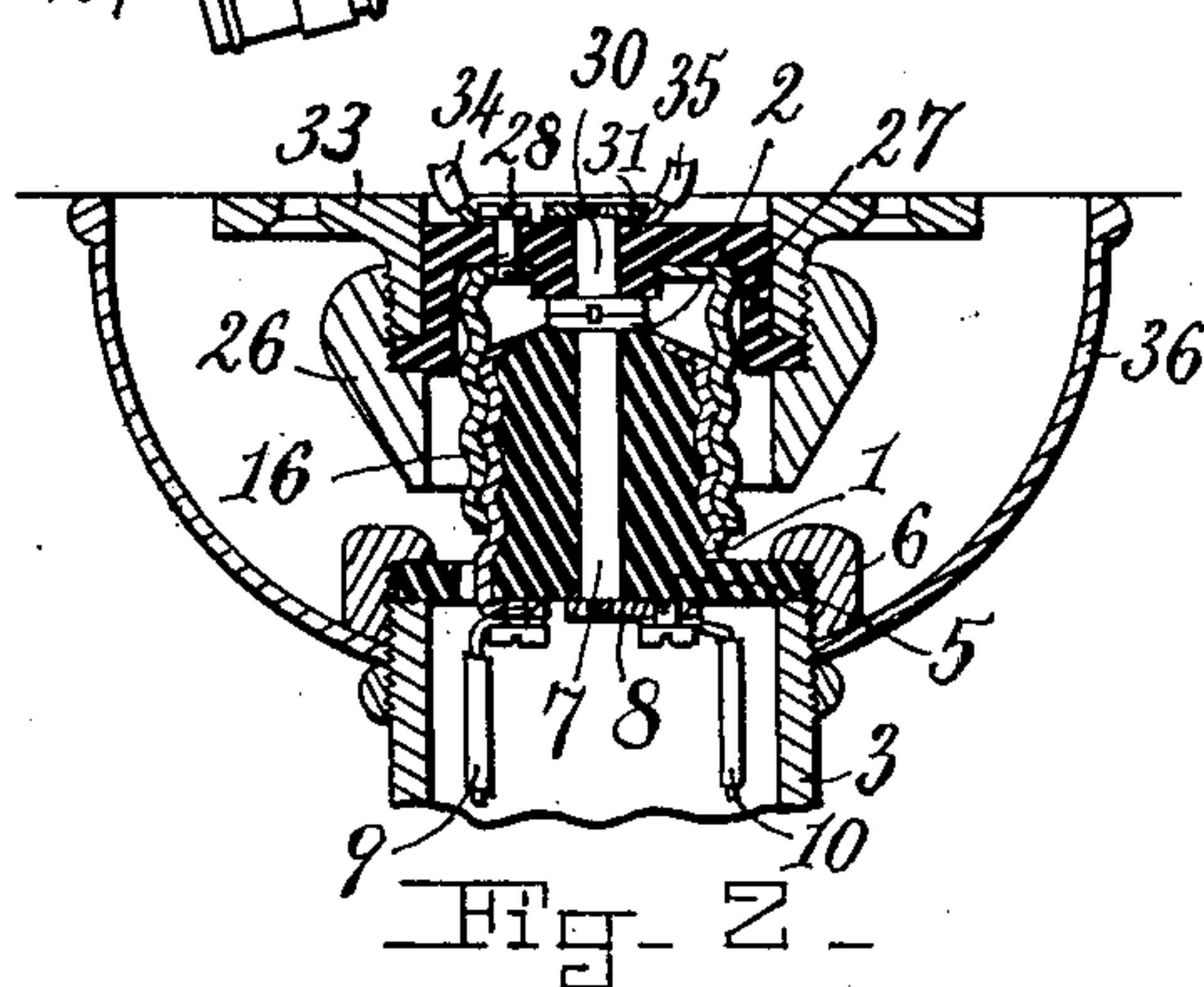
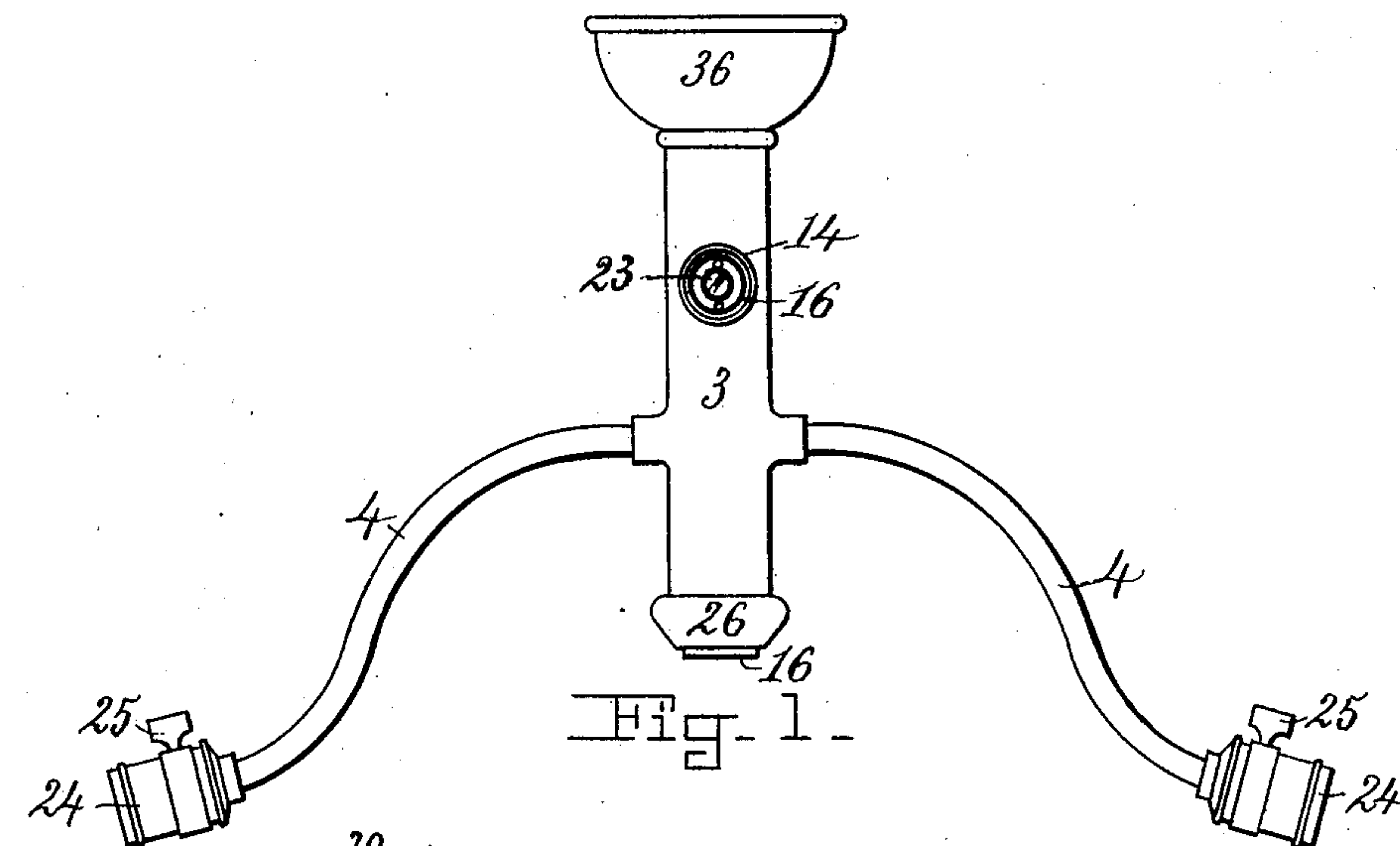
PATENTED JUNE 14, 1904.

W. H. KELSEY.
ELECTRIC PLUG OR SOCKET EXTENSION.

APPLICATION FILED OCT. 9, 1902.

NO MODEL.

3 SHEETS—SHEET 1.



Witnesses.
Arthur C. Jones.
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William H. Kelsey
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Henry Chadbourne
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No. 762,535.

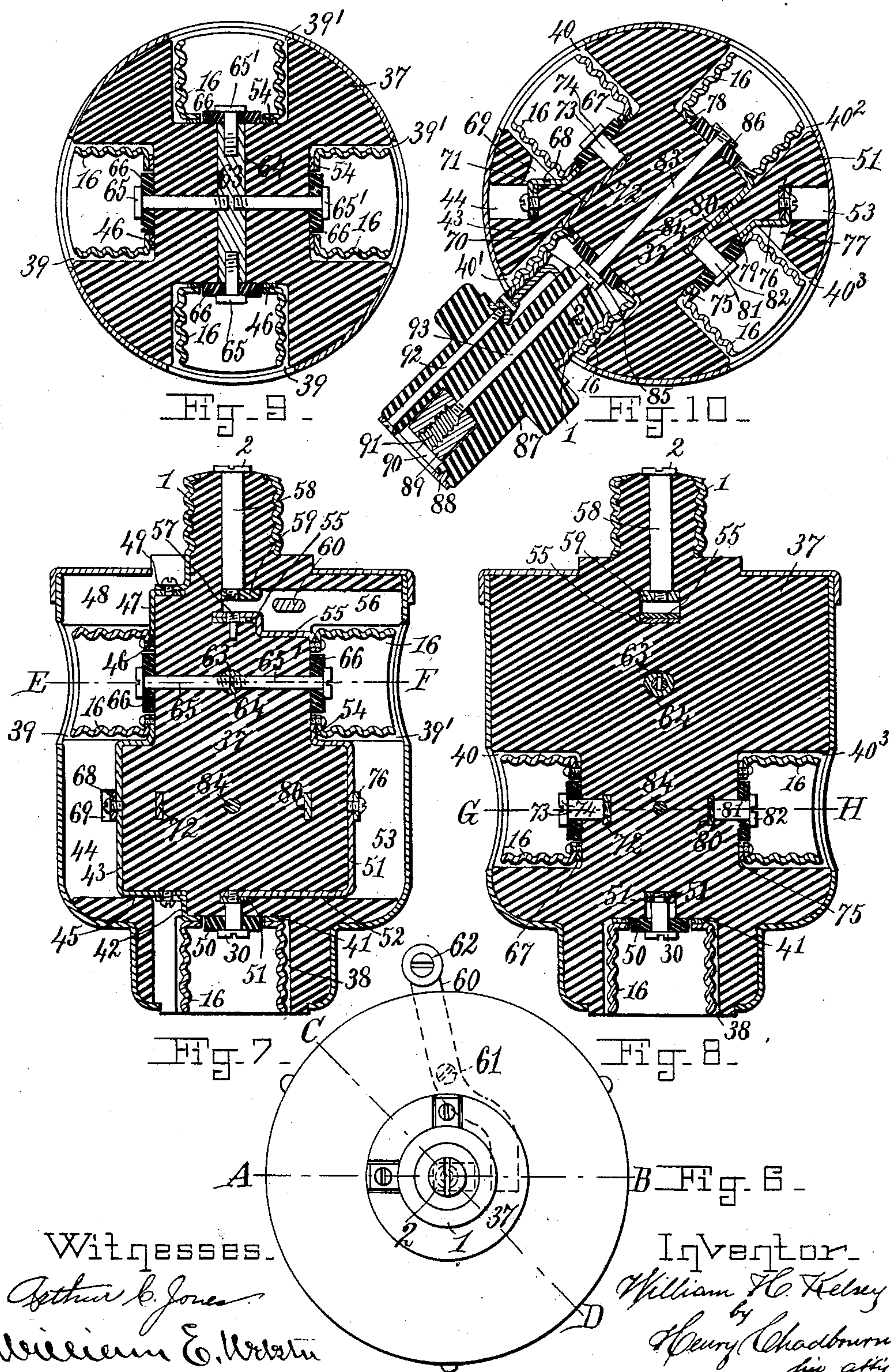
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3 SHEETS—SHEET 2.



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3 SHEETS—SHEET 3.

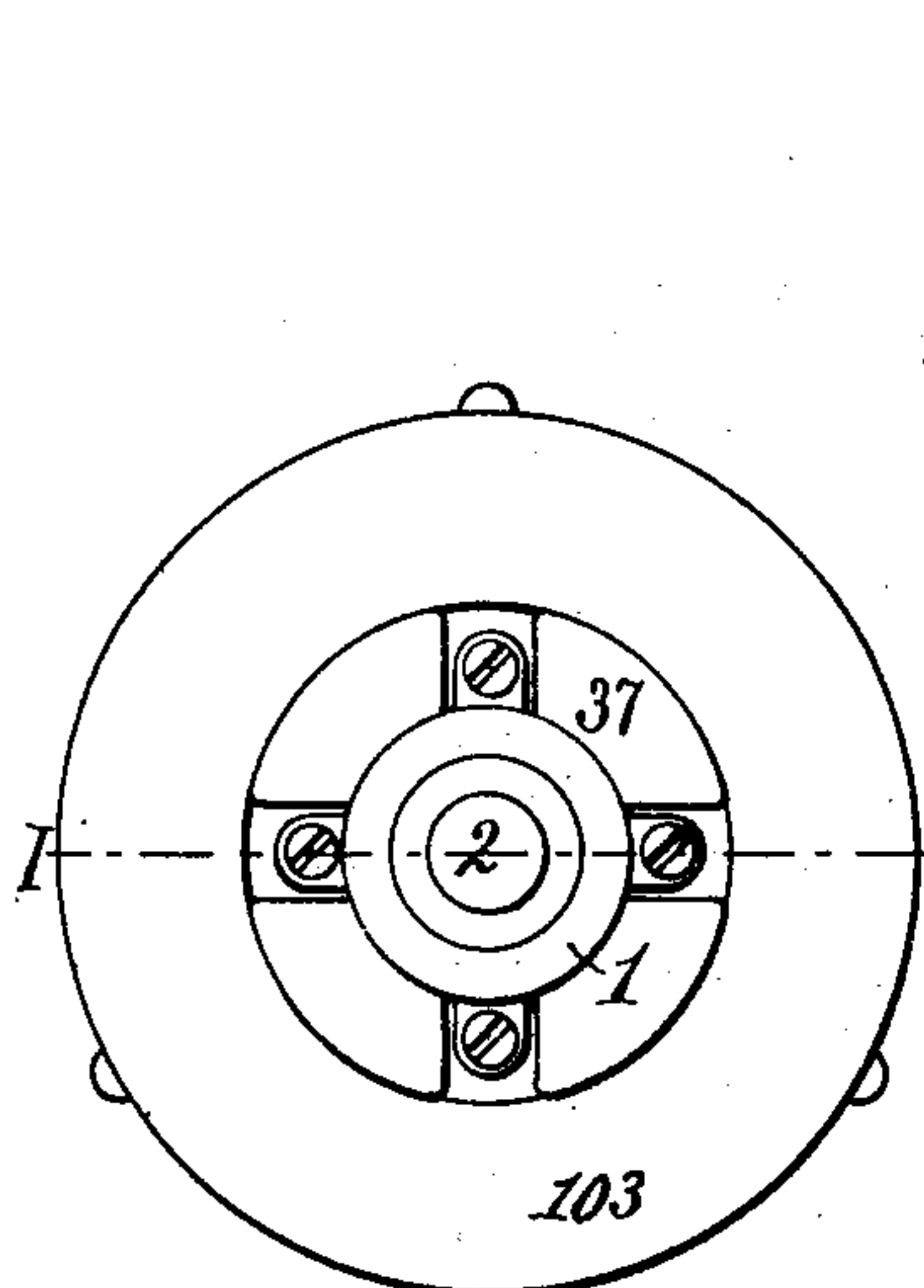


Fig. 11.

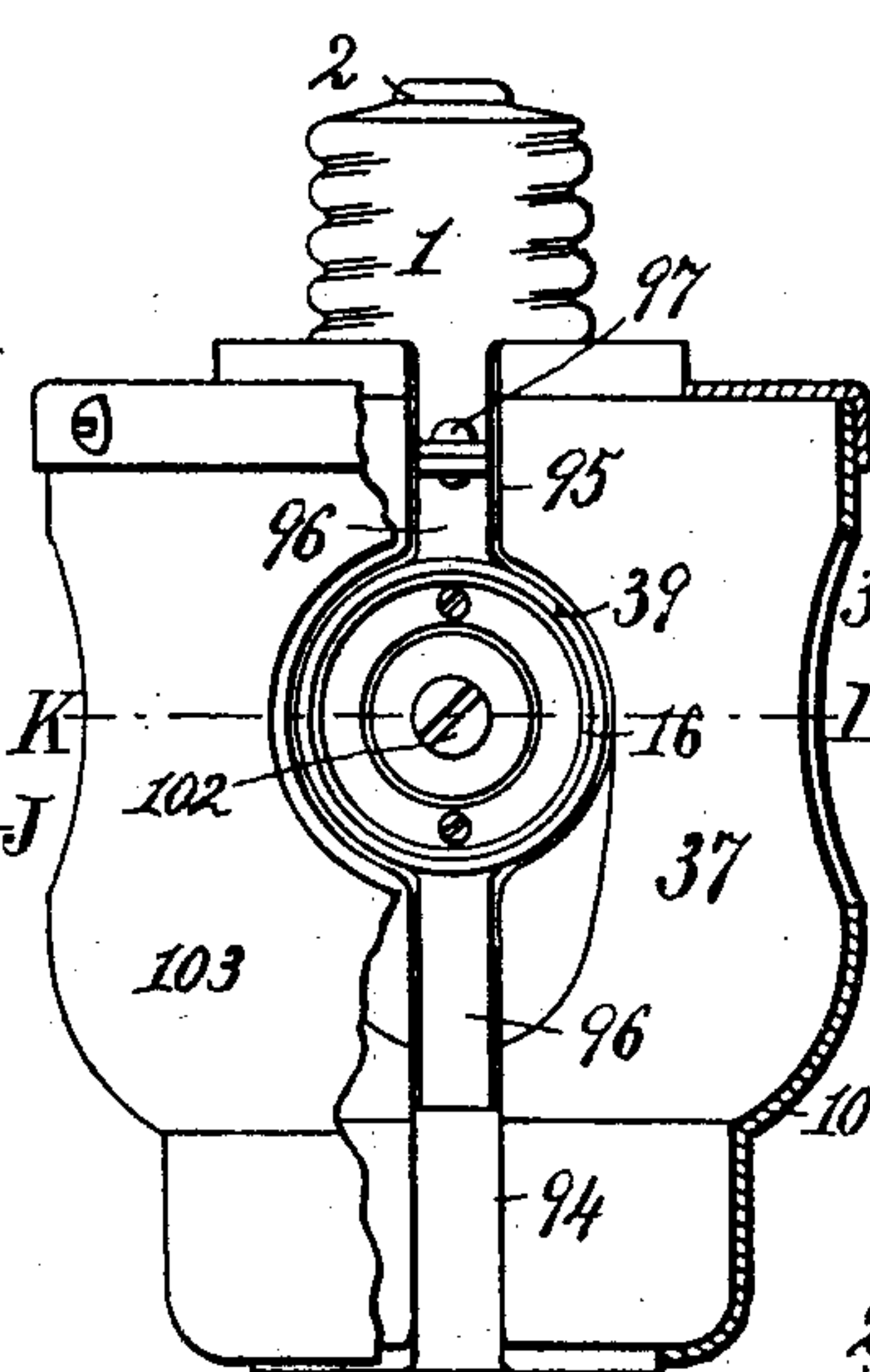


Fig. 12.

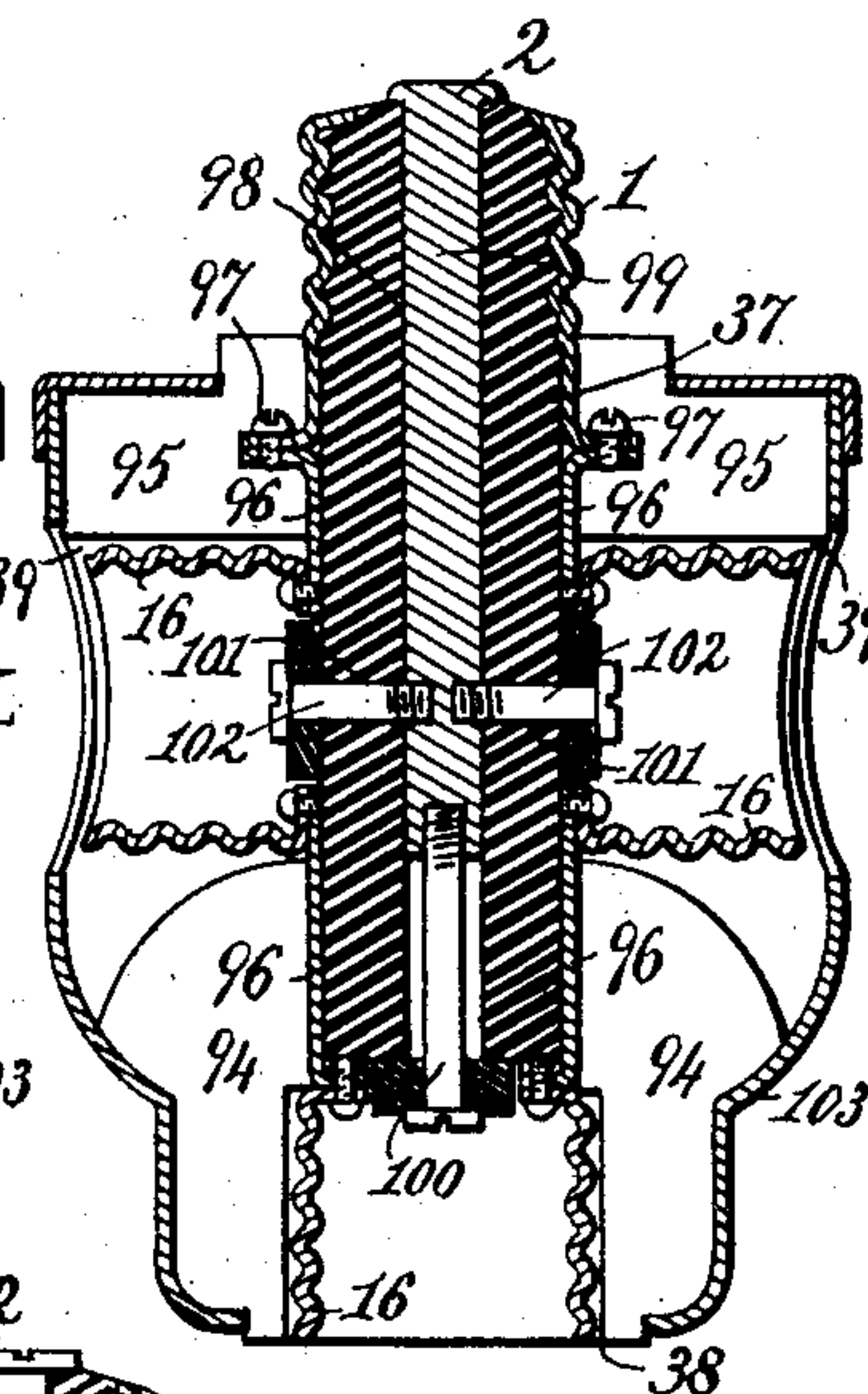


Fig. 13.

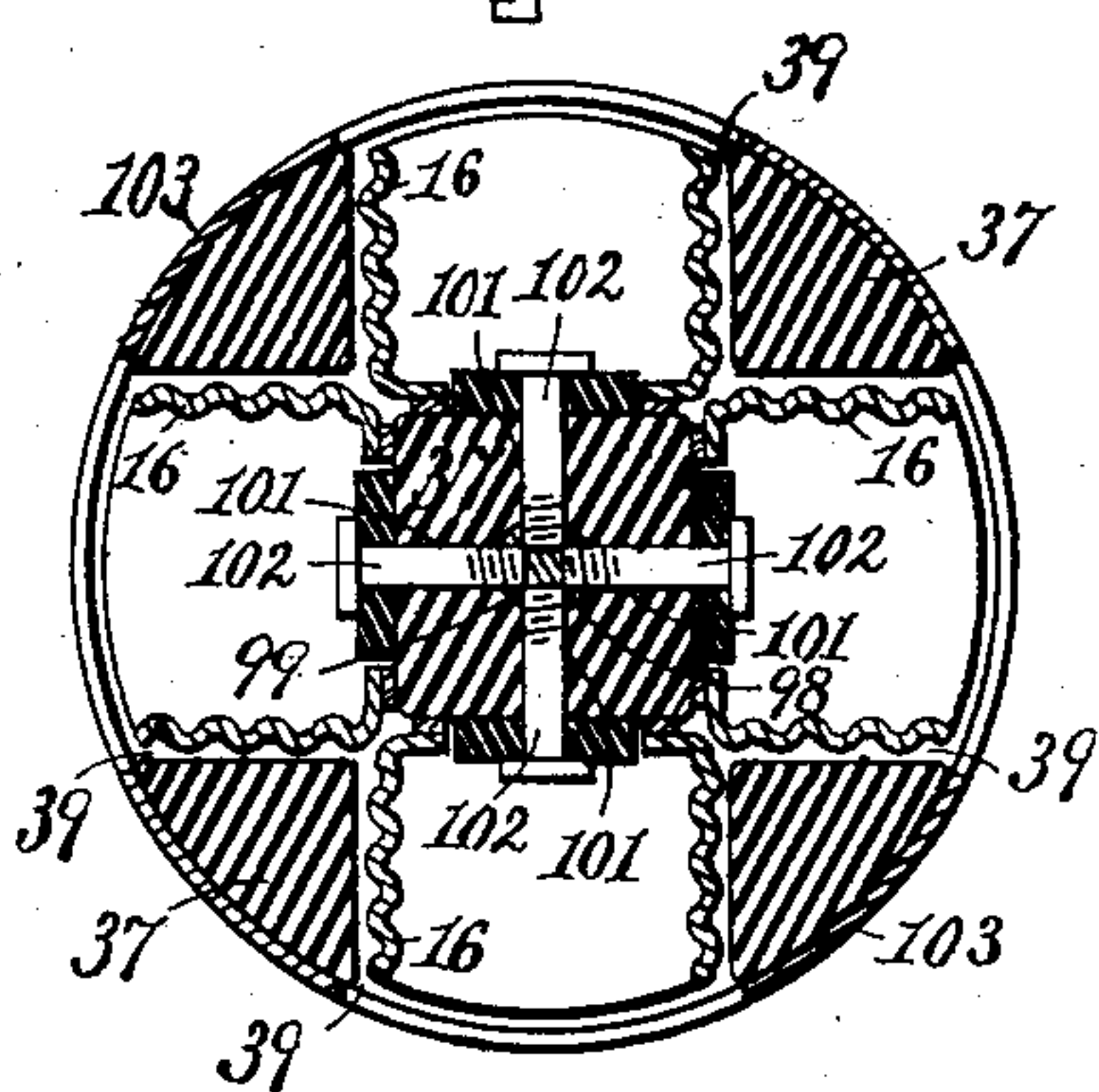
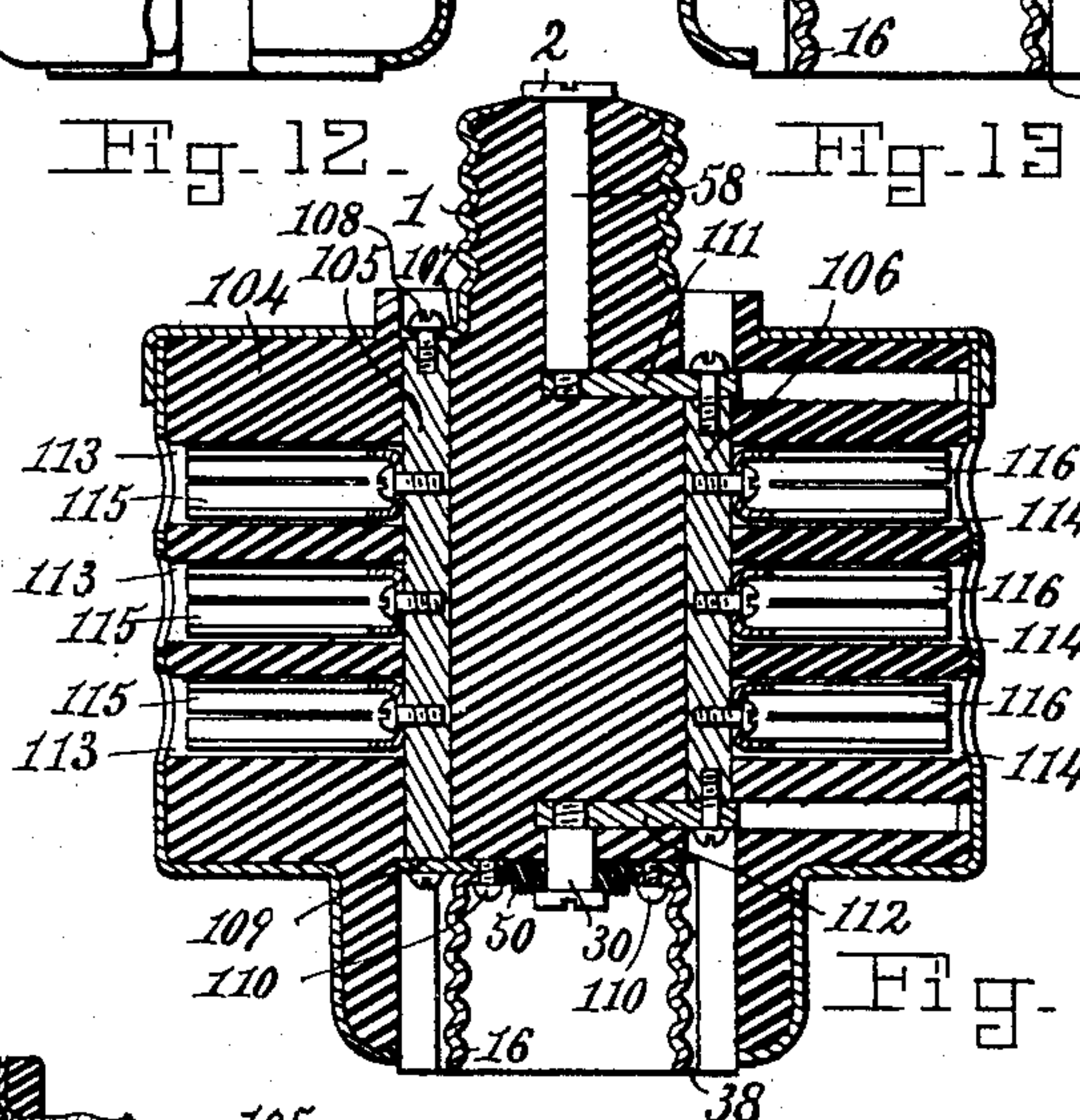


Fig. 14.



UNITED STATES PATENT OFFICE.

WILLIAM H. KELSEY, OF CAMBRIDGE, MASSACHUSETTS.

ELECTRIC PLUG OR SOCKET EXTENSION.

SPECIFICATION forming part of Letters Patent No. 762,535, dated June 14, 1904.

Application filed October 9, 1902. Serial No. 126,630. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. KELSEY, of Cambridge, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Electric Plug or Socket Extensions, of which the following is a specification.

This invention relates to improvements in socket and plug extensions, designed more especially as a portable or removable fixture to be used in connection with an electric socket or plug and to provide means whereby a plurality of lamps or other devices using electricity may be detachably attached to the device, and whereby the style of the sockets and plugs on the extension may differ or may be the same as the socket or plug to which the extension is to be attached, and whereby the various sockets and plugs on the extension itself may be of the same or of different styles.

The invention has for its object to provide a novel socket or plug extension which shall be neat, convenient, easily applied, and simple in construction, therefore not liable to get out of order, and also to provide means whereby lamps or other devices requiring electricity of the same or of different potentials may be used and arranged in series or in parallel.

The invention consists of the novel constructions, arrangements, and combinations of parts, as fully described hereinafter and claimed, and it is carried out substantially as illustrated on the accompanying drawings, which form an essential part of this specification, and whereon—

Figure 1 represents a side elevation of my improved socket or plug extension arranged as a portable chandelier. Fig. 2 represents a detail longitudinal section of the upper end of the device as shown in Fig. 1 and showing the arrangement of a preferred form of socket on the ceiling, to which the extension is attached. Fig. 3 represents a detail longitudinal section of the lower end of the device as shown in Fig. 1, showing a socket therein adapted to receive the plug end of an electrically-operated device to be attached thereto. Fig. 4 represents a detail section showing one of the manners of running the electric conductors into a branch of the main cas-

ing. Fig. 5 represents a detail section showing another manner whereby a current of electricity may be conducted into and from a detachable branch casing from and into the main casing. Fig. 6 represents a plan view of another arrangement of my improved socket and plug extension, which is arranged to be attached to an electric socket and to receive the connecting plug ends of several different electrically-operated devices and whereby the connections between the receiving-sockets for such plug ends are such that said devices may be arranged in series, in parallel, or in a combination of series and parallel or in all of said arrangements as desired. Fig. 7 represents a central longitudinal section of the device shown in Fig. 6 on the line A B on said Fig. 6. Fig. 8 represents a central longitudinal section of the same device on the line C D in Fig. 6. Fig. 9 represents a cross-section of the device on the line E F in Fig. 7. Fig. 10 represents a cross-section of the device on the line G H in Fig. 8, also showing a section of another form of my improved device attached thereto, whereby the device may be adapted to be attached to an electric socket of a style differing from those contained therein. Fig. 11 represents a plan view of another arrangement of my improved socket and plug extension, which is arranged to receive the connecting plug ends of the several different electrically-operated devices and whereby the connections between the receiving-sockets for said plug ends are such that any one or all of said sockets may be used and when used will be arranged in multiple with those in the other sockets. Fig. 12 represents a sectional side elevation of the extension shown in Fig. 11. Fig. 13 represents a central longitudinal section of the extension on the line I J in Fig. 11. Fig. 14 represents a cross-section of the extension on the line K L in Fig. 12. Figs. 15 and 16 represent, respectively, a central longitudinal section and a cross-section of another arrangement of my socket and plug extension in which single-pole sockets are used. Figs. 17 and 18 represent, respectively, a central longitudinal section and an end view of one of the sockets which may be used in the arrangement of the extension shown in Figs. 15

and 16. Figs. 19 and 20 represent, respectively, a central longitudinal section and an end view of one of the plug ends which may be used in connection with the socket shown in Figs. 17 and 18. Fig. 21 represents the preferred manner of forming the electric conductor used within the socket extension to connect and hold one or more of the sockets used therein and showing the same in plan view prior to bending the same into the shape it assumes when within the socket extension.

Like characters of reference refer to like parts wherever they occur on the different parts of the drawings.

On the drawings in the principal views thereon I have shown my invention arranged as a detachable or portable socket and plug extension to be used in connection with "Edison" sockets and fixtures, and consequently have provided the extension with what is known in the trade as "Edison" plug ends and sockets wherever such are used; but it will be understood that plug ends and sockets such as the "Thomson-Houston," "Swan," or of any other make might be used in lieu of those shown.

In Figs. 1 to 5, inclusive, I have illustrated my improved socket extension arranged as a portable chandelier. In this construction I provide the upper end of the extension with a plug end by which the extension may be attached to a suitable socket which is permanently attached to the wall or ceiling of a room or other place where the extension is to be used. The plug end shown at the upper end of the socket extension consists of the outer screw-threaded shell 1, which forms one electric terminal of the plug end, and the metal piece 2, which forms the opposite terminal of such plug end. The main part of the casing of the extension consists of a tubular portion 3 and has attached thereto one or more branch arms 4, which may be permanently or detachably attached thereto, as may be desired and as will be understood by the complete description of the extension hereinafter contained. To the upper end of the tubular portion 3 of the casing is attached the plug end by which the extension is attached to the socket when desired and it is necessary that the electric terminals in this plug end should be insulated from the casing 3. On the drawings the plug end has been shown as being provided with the frame portion 5, made of insulating material and provided with flanges which in connection with a ring 6, screwed on the screw-threaded end of the tubular casing 3, firmly secures the plug end to the tubular portion 3 of the casing. The metal piece 2, which forms one electric terminal on the plug end, is made upon the end of a rod 7, which passes through a perforation in the frame portion 5 of the plug end and has its inner screw-threaded end screwed into a block 8 within the tubular portion 3 of the casing. Conductors or

wires 9 and 10 are attached, respectively, to the shell 1 and to the block 8, and therefore are in electrical connection with the respective terminals 1 and 2 of the plug end and by which a current of electricity may be conducted between such terminals and the interior of the tubular casing. If permanently-connected arms 4 are to be used so as to radiate from the tubular casing 3, I prefer to run the conductors from the casing directly into the arms, and vice versa, substantially as shown in Fig. 4; but when the arms 4 are to be made detachable and interchangeable with other arms I prefer to provide the casing 3 with a socket or plug at the place where the arm is to be attached and to provide the arm 4 with a socket or plug which may be connected to the socket or plug in the casing, so as to properly and electrically connect the conductors in the arm to those in the casing, and thereby conduct a current of electricity into and from the arm 4 and substantially as shown in Fig. 5. In Fig. 4 the arm 4 is screwed into a screw-threaded perforation 11 in the main casing 3, and the conductors 12 and 13 run between the interior of the casing 3 and the interior of the arm 4. In Fig. 5 the arm 4 is detachably attached to a collar or sleeve 14, screwed into a screw-threaded perforation in the casing. Within the casing 3 is a block 15, preferably made of insulating material, as porcelain, and held in position within the casing 3 by two or more of the sleeves 14, which radiate from the center of the casing. To the block 15 is secured the internally-screw-threaded metallic shell 16, which forms the electric socket to receive the plug end contained within the arm to be attached at this place. Between the shell 16 and the block 15 is placed a ring-shaped plate or washer 17, having ends projecting from the sides of the same, and to said ends at opposite ends of the block 15 are attached the conductors 18 and 19. It will thus be seen that there is an electric connection between the conductor 18, the shell 16, and the conductor 19. It will be understood that a number of shells 16, with attached conductors 18 and 19, may be arranged upon the block 15 so as to radiate from the center line of said block. The block 15 is provided with a perforation within which a headed metal bar or rod 20 is held, and to the upper and lower ends of this rod are secured the respective conductors 21 and 22. A screw 23 is screwed into the rod 20 from the center of the inner end of each shell 16 radiating from said bar, leaving its head slightly projecting, and it will thus be seen that the heads of these screws form the opposite terminals of the sockets to that formed by the radiating shells 16. Each arm 4 is provided at its outer end with a socket 24 of the usual construction and connected to the conductor within said arm as usual, which sockets may or may not be provided with a switch or cut-off 25, as desired. Electric

lamps or any other device having a suitable plug end may be connected to the sockets 24, and, if so desired, may be connected directly to the sockets 16 and without the use of arms 4, with their sockets 24. Between the lower end of the tubular casing 3 and a flanged ring 26 is secured an inverted-cup-shaped piece 27, of insulating material, and to the under side of this piece 27, within the cupped portion thereof, is secured a screw-threaded shell 16 similar to those held within the perforations in the casing and above referred to. A screw 28, inserted through a perforation in the piece 27 and screwed into the shell 16, provides means for securing a conductor 29, located within the casing 3, in electrical connection with the shell 16. Thus the shell 16 forms a socket at the extreme lower end of the casing 3 for the reception of the plug end of a lamp or any other device using electricity. A screw-bolt 30, inserted through a perforation in the piece 27 and insulated from the shell 16, has its head portion forming the opposite electric terminal of the socket to that formed by the shell 16. A nut 31 on the bolt 30 retains said bolt in place and clamps the conductor 32 into electrical contact with said bolt.

Although it is possible to connect my improved extension, as above described, to any Edison socket, it is desirable that a specially-constructed socket should be used, and I have shown such a socket on the drawings in Fig. 2. This socket is the same as that which is located at the lower end of the extension and has been described above in relation to Fig. 3, the only difference being in the substitution of a screw-threaded flanged collar 33 for the lower end of the tubular casing 3. In the preferred form of socket to which the extension is to be attached the flanged collar 33 is attached to the wall, ceiling, or any other place where it is desired to have the same. A screw-threaded collar 26 is screwed upon said flanged collar, thereby clamping the insulated piece 27, with its attached metal shell 16, in place. A bolt or screw 28 holds a conductor 34 in electrical connection with the shell 16, while the bolt 30 forms the opposite electric terminal of the socket to that formed by the shell 16, and the nut 31 on said bolt holds the bolt in place and a conductor 35 in electric connection with said bolt.

In order to add to the appearance of my improved socket extension, as above described, and also to add to the stability of the same when connected to a socket, as shown in detail in Fig. 2, I prefer to provide the upper end of the tubular portion 3 of the casing with a cup-shaped flange 36, which rests against the wall or ceiling when the extension is attached to the socket on the wall or ceiling and substantially as shown in Fig. 2.

The socket extension may be made with both permanently-attached or detachably-attached

arms, and I have illustrated the extension in Fig. 1 as being provided with both kinds of arms.

From the above description of Figs. 1 to 5 of the drawings it will be seen that an open electric circuit may be formed within the socket or plug extension, having one terminal at the shell 1 and the other terminal at the metal piece 2 of the plug end on the socket or plug extension, and that sockets may be arranged upon said extension, which will be in series and a part in multiple. It will also be seen that although I have used different reference-numerals for the different conductors in Figs. 2, 3, 4, and 5 those shown in one view may be a continuation of those shown in another view—as, for instance, the conductor 12 in Fig. 4 may be a continuation of the conductor 9 in Fig. 2. Likewise the conductor 29 in Fig. 3 may be a continuation of the conductor 13 in Fig. 4, or the conductors 18 and 21 in Fig. 5 may be respectively continuations of conductors 9 and 10 in Fig. 2.

The extension illustrated in Figs. 6 to 10, inclusive, is also shown as being provided with a plug end, by which it may be attached to any Edison socket. This plug end consists of the outer screw-threaded metallic shell 1 and a central projecting metal piece 2 at the outer end of the plug end, the same as above described in relation to Figs. 1 to 5, inclusive. The shell 1 and pieces 2 are insulated from each other and form the two terminals for the electric currents to be carried through said plug end when connected to a suitable socket in the same manner as above described in relation to the extension, as shown in Figs. 1 to 5. The main body or frame of the extension (shown in Figs. 6 to 10, inclusive) is preferably made cylindrical, as shown, and is made from some insulating material—such as porcelain, glass, hard-rubber fiber, or similar insulating material. This frame of the extension is molded or shaped with suitable perforations, recesses, cavities, grooves, chambers, and projections arranged thereon and adapted to receive the various parts which constitute the device, as will be fully described hereinafter. This frame or body 37 of the extension is provided with a cavity or recess, which cavity is at the end of the frame opposite to the plug end. This frame also extends into the plug end and forms the insulation between the shell 1 and the piece 2. Two series of cavities 39 39' and 40 40' 40" 40³ are shown in the drawings as having four cavities in each ninety degrees apart and arranged upon the sides of the frame 37, which cavities are preferably in two rows one above the other, the cavities in one series preferably alternating with the cavities in the other series, so as to be able to reduce the length of the extension as much as possible. The several cavities in the frame are connected by suitable grooves, channels, and perforations substantially as herein-

after described. Within the cavity 38 is placed the washer 41, which has a strip 42 made in one piece with said washer and is preferably attached to the strip 43, placed within the groove 44 and passing through the perforation 45 in the frame 37. The strip 43 is made in one piece with the washer 46, placed within one of the side cavities 39 in the frame. A strip 47, made in one piece with the washer 46, extends from said washer through the groove 48 in the frame, where it is detachably connected to a strip 49, made in one piece with the shell 1. As the washers 41 and 46 and the strips 42, 43, 47, and 49 are all made from metal, it will be seen that they will form an electric conductor from the shell 1 and into the cavities 39 and 38. A second washer 46 is placed within the other cavity 39, as shown in Fig. 9, and similar connections are made between the washer 41 in the cavity 38 and the shell 1 through the second washer 46 by means of strips 42, 43, 47, and 49 similar to those above described; but only a part of this last connection between the cavity 38 and shell 1 has been shown, as its construction is an exact duplicate of that shown in Figs. 7 and 9 and needs no further illustration. Internally-screw-threaded shells 16 similar to those above described in relation to Figs. 1 to 5 are placed within the cavities 39 39' and are riveted or otherwise firmly secured to the washers 46 46 within said cavities. A similar shell 16 is placed within the cavity 38 and firmly secured to the washer 41 within said cavity. It will be seen that the shells 16 in the above-mentioned cavities 38 and 39 will be in electrical connection with the shell 1 of the plug end and will each constitute one pole of the socket formed within each of said cavities. Within the cavity 38 is a screw 30, which is insulated from the washer 41 and its attached shell 16, substantially as shown, either by an independent washer 50 or by having projection on the frame 37 made in the same shape as the washer 50. The screw 30 is screwed into a strip 51, placed within a perforation 52 and a groove 53 in the frame 37, as shown in Fig. 7. A washer 54, preferably made in one piece with the strip 51, is placed within one of the cavities 39', as shown in said Fig. 7. A strip 55, made in one piece with the washer 54, is placed within a chamber 56 in the frame 37 and is held in its proper place within said chamber by means of a screw-headed pin 57, which enters a similar-shaped recess in the frame 37, or said strip may be held in place by any other suitable and well-known means. The central metal piece 2 of the plug end at the upper end of the frame 37 is made in the form of a head on the rod 58, the lower end of which is screwed in the metal block 59, located within the chamber 56 directly above, but separated from the strip 55. A second washer 54 is placed within the other cavity 39' and has similar integral strips 51

and 55 placed within a similar perforation 52, groove 53, and the chamber 56, this second strip 55 being held in place within the chamber 56 by the same screw-headed spike or pin 57 and the screw 30 being attached to both strips 51. Internally-screw-threaded shells 16 similar to those above described are placed within the cavities 39' and 39' and are secured to the washers 54 54 within said cavities by rivets or by any other equivalent means. It will thus be seen that the screw 30, the strips 51, washers 54, the strips 55, the block 59, and rod 58 form electric conductors between the central electric terminal in the cavity 38 and the metal pieces 2, forming a central terminal on the plug end of the extension, which conductors are only broken between the block 59 and strips 55 within the chamber 56, and that the shells 16 in the cavities 39' 39' will be in electrical connection with the electric conductors passing through said cavities. Within the chamber 56 is placed a suitably-shaped switch-lever 60, which may be turned upon its fulcrum 61 so that portions thereof will contact with the strips 55 or with the screw 57 holding them and also with the block 59. Thus when the lever is turned into contact with the strips 55 and the block 59 an unbroken electric conductor is formed between the screw 30, which forms the opposite pole to the shell 16 of the socket in the cavity 38, and the metal piece 2, which forms the opposite pole to the shell 1 of the plug end on the opposite end of the socket extension to that of the cavity 38, which electric conductor can be broken at any time when desired by the operation of the switch-lever 60, which has a handle 62 of any suitable shape projecting outside the casing of the extension, as shown in Fig. 6. From the above description it will be seen as the shell 1, forming one pole of the plug end, is in electrical connection with the shell 16, forming one pole of the socket formed in the cavity 38, and as the opposite pole 2 of the plug end is in electrical connection with the opposite pole 30 of the socket formed in the cavity 38 that the electric lamp or other device connected to the socket in said cavity 38 will complete the circuit through said socket. A metal bar 63 is placed within a perforation 64 in the frame 37, and screws 65 65 and 65' 65' are screwed into the bar 63 from the centers of the respective cavities 39 39 and 39' 39'. These screws form electric terminals of the sockets to be formed within the respective cavities 39 and 39' to the terminals formed by the shells 16 within said cavities, and it will be seen that these screws are in electric connection with each other through the bar 63 and are insulated from other parts of the extension by means of the frame 37 and insulating-washers 66, placed upon each screw. As the shells 16, forming one terminal of the sockets to be formed in the cavities 39, are in electric connection with the

shell 1, forming one terminal of the plug end, and as the shells 16, forming one terminal of the socket to be formed in the cavities 39', are in electric connection with the metal piece 2, forming the other terminal of the plug end, and also as the screws 65 and 65', forming the opposite terminals in the sockets to be formed in the respective cavities 39 and 39', it will be seen that by introducing a lamp or other electric device, and thus forming an electric connection between the shell 16, forming the terminal in either of the cavities 39 with the screw 65, forming the other terminal of the socket in the cavity, there will be no closing of the electric connection between the shell 1 and the metal piece 2, which is the opposite terminal of the plug end through said lamp or other device, but that it will be necessary for a lamp or other device to be introduced within the socket in either of the cavities 39', thus forming an electric connection between the shell 16 and the screw 65' in said cavity in order to complete the circuit between the two terminals of the plug end, and therefore the lamps or other device in the cavities 39 and 39' will be arranged in series and that there will be as many series of lamps or other devices as the greatest number of cavities 39 or 39' used on the extension. By this means I am able to use lamps or other electric devices which present different degrees of resistance to a current of electricity in the different sockets on the extension, those used in the socket in the cavity 38 being of greater resistance than those used in the sockets in the cavities 39 and 39'. When the same current is desired, the sum of the resistances 39 and 39' is equal to the resistance in 38.

Referring to Fig. 10 of the drawings, in which the arrangement of the conductors leading to and from the series of cavities 40, 40', 40², and 40³, and the construction of the sockets within said cavities are more clearly shown, and also referring to Figs. 7 and 8 of the drawings for a further illustration of the same, within the cavity 40 is placed a sheet-metal washer 67, similar in construction to that of the washers 41, 46, and 54 in the cavities 38, 39, and 39'. This washer is connected to the metal strip 43 by means of a thin metal strip 68, made in one piece with the washer 67 or attached thereto and inserted through a perforation 69 in the frame or body of the extension. To the washer 67 is secured a shell 16, similar to those within the other cavities above mentioned. It will thus be seen that the shell 16 within the cavity 40 is in electric connection with the shell 1 of the plug end through the washer 67, the metal strips 68 and 43, the washer 46, and the metal strips 47 and 49, and forms one terminal of the socket to be formed in said cavity. Within the cavity 40' is placed a washer 70, to which a shell 16 is firmly attached, and this washer is provided with a metal strip 71, made in one piece

therewith or attached thereto, which metal strip is inserted within a recess 72 in the frame or body of the extension and has a screw 73 screwed into said strip from the center of the bottom of the cavity 40. The head 74 of the screw 73 forms the opposite terminal of the socket in the cavity 40 to that of the shell 16 in said cavity, while the shell 16 in the cavity 40' forms one terminal of the socket to be formed in said cavity 40', and it will be seen that these two terminals in the cavities 40 and 40' are in electric connection with each other, but are insulated from other parts by the frame or body 37 of insulating material. Within the cavity 40³ is arranged a washer 75, with a shell 16 attached thereto, said washer having a metal strip 76 made in one piece with said washer and passing through a perforation 77 in the frame 37, where it is attached to the strip 51 in a similar manner to the washer 67, shell 16, and strip 68 within the cavity 40, and it will be seen that this shell 16 in the cavity 40³ is in electrical connection with the metal piece 2 of the plug end through the washer 75, the strips 76 and 51, the washer 54, the strip 55, the switch-lever 60, the block 59, and rod 58 when the switch-lever is turned so as to contact with the strip 55 and the block 59, and it will also be seen that the shell 16 within the cavity 40³ forms one terminal of the socket to be formed within said cavity 40³. Within the cavity 40² is placed a washer 78, with a shell 16 firmly attached thereto, said washer having a metal strip 79 made in one piece therewith or firmly attached thereto, which metal piece is inserted within a recess 80 in the frame or body 37 and receives a screw 81, screwed into said strip from the center of the cavity 40³, the head 82 of said screw forming an opposite terminal of the socket formed in the cavity 40³ to that of the shell 16 within said cavity 40³, while the shell 16 within the cavity 40² forms one terminal of the socket to be formed within the cavity 40², and it will also be seen that the shell 16 in the cavity 40² is in electric connection with the head 82 of the screw in the cavity 40³ in a manner similar to the washer 70, the shell 16, the metal strip 71, the recess 72, and the screw described in relation to the cavity 40'. A rod 83 is inserted through a perforation 84 in the frame or body 37 of the extension and has its head 85 located in the center of the cavity 40' and forming an opposite terminal of the socket to be formed in the cavity 40' to that formed by the shell 16 within said cavity. The rod 83 has a nut 86 thereon, which nut is located in the center of the bottom of the cavity 40² and forms the opposite terminal of the socket to be formed within said cavity 40² to that formed by the shell 16 within said cavity.

From the above description it will be seen that one terminal of each socket to be formed within each cavity 40, 40', 40², and 40³ is in

electric connection to one terminal of the socket to be formed within one of the other of said cavities, that the terminals so connected are insulated from other metallic parts of the device, and that the shells in the respective cavities 40 and 40³ are in electric connection with the opposite terminals of the plug end. It will therefore be seen that it will be necessary to insert a lamp or other electric device in each of the cavities 40, 40', 40², and 40³, thereby electrically connecting the two terminals of the sockets within each of said cavities before an unbroken electric connection can be made between the two terminals of the plug end and through any of the devices inserted within said cavities. By the construction of the conductors between the terminals of the socket formed in the cavities 40, 40', 40², and 40³ it will be seen that lamps or other devices connected to said sockets will be arranged in series and that it will require the insertion of a suitable plug end in all of said sockets before a current of electricity will flow through any of said sockets, and consequently electric devices presenting different resistances to the flow of the current may be used in said sockets.

It will be understood that when a single lamp of low resistance is desired to be used it may be connected to the socket in either of the cavities 40, 40', 40², or 40³, and in order to complete the circuit through said lamp I will place plugs in each of the sockets formed in the other cavities, which plugs will themselves contain sufficient resisting power to the flow of a current of electricity to properly control said current of electricity.

By the use of the socket extension, as shown in Figs. 6 to 10, inclusive, I am able to use upon the same extension lamps or other electric devices having various degrees of resistance and can use them all at the same time or singly, as desired. I may also have the initial current of a high potential and reduce the potential the necessary amount by the introduction of plugs in the other sockets, which plugs will be of such a resistance as to leave the necessary potential for the lamp or other device desired to be used.

In some cases it is necessary for two or even more of my improved extensions of different arrangements to be coupled together and be used in order to adapt the same so as to be attached to either a socket or plug or to a socket or plug of a different make either on the lamp or other device or on the feed-wire which supplies the current of electricity. In Fig. 10 I have illustrated two of my improved extensions of different arrangements coupled together, so as to adapt an extension having Edison plugs and sockets to a Thomson-Houston socket on a feed-wire or so that a lamp or other electric device having a Thomson-Houston socket can be attached to a socket or plug extension provided with Edison

sockets. In this second extension the main body 87, of suitable insulating material, has a shell 1 and a metal pin 2 at one end of said body similar to the other extension, above described, and which form the opposite terminals of an Edison plug end. The opposite end of the body 87 has a washer 88 on the outer end thereof and the metal piece 89 within a recess 90 in the end of said body, which metal piece has a screw-threaded recess 91, substantially as shown. The washer 88 and metal piece 89 form the opposite terminals of a Thomson-Houston plug end, which may be connected to any Thomson-Houston socket. The washer 88 and the shell 1 on opposite ends of the body 87 are in electrical connection with each other by means of the screw or screw-threaded rod 92. The metal piece 2 is made on the end of a screw-threaded rod 93, which passes through a perforation in the body 87 and is screwed into the metal piece 89 at the opposite end of said body. It will thus be seen that this rod 93 forms a metal connection between the metal pieces 2 and 89. By the use of this arrangement of my extension with or without a second extension it will be seen that I am able to attach lamps or other electric devices having Edison or Thomson-Houston plugs or sockets to a socket on a feed-wire, which socket is of either construction. It will be also understood that I am not confined to forming this arrangement of my extension with an Edison and Thomson-Houston plug end at opposite ends thereof, but that I may form the same with other and well-known constructions of plug ends, according to the requirements.

Referring to the arrangement of my invention as illustrated in Figs. 11 to 14, inclusive, the body portion of the extension is provided at its end opposite to the plug end with a cavity 38, and the side of said body portion is provided with one or more cavities similar to those described in relation to Figs. 6 to 10. The end cavity 38 and the side cavities 39 are connected by grooves or channels 94, and similar grooves or channels 95 extend from the side cavities 39 toward and to the plug end 1 on the extension. A thin metal strip or plate 96 (shown in Fig. 21) is so shaped and bent that washer-shaped portions of it will rest at the bottom of each cavity 38 and 39, while connecting portions will rest within the grooves or channels 94 and 95. The shell 1 of the plug end is formed with projecting ears, which extend into the grooves or channels 95 and are connected in any suitable manner to the portions of the plate 96 resting in said grooves or channels. On the drawings this connection is formed by means of suitable screws or rivets 97. The portions of the plate 96 which rest within the cavities 38 and 39 are preferably made in ring form, leaving a central perforation therein, as shown in Fig. 21, for a purpose to be understood by the complete description of the device. Thin metal shells 16

16 are inserted within the cavities 38 and 39 and are riveted or otherwise secured to the plate or strip 96. These shells are preferably attached to the plate or strip 96 prior to inserting said plate within the cavities and channels. As the shell 1 of the plug end is attached to the plate or strip 96 and as the shells 16 are also attached to said plate, it will be seen that all of said parts are in electrical contact with each other and together form an electric conductor for a current of electricity having a terminal at the shell 1 and also at each socket 16 to connect with terminals of branch circuits to be connected at said places to said conductor. Within a central perforation 98 in the frame of the extension is placed a threaded metal bar or rod 99, the upper or threaded end of which forms the terminal 2 of the plug end, while the opposite or lower end thereof is provided with a screw 100, which projects into or through the perforations in the plate 96 and forms the terminal of the branch circuit, the opposite terminal of which is formed by the shell within the cavity at the end of the frame. Branch perforations 101 are formed in the frame of the extension, which branch perforations extend from the perforation 98 to the center of each of the cavities 39, and within each of these branch perforations is a headed branch rod 102, the inner ends of said bars being attached to or in electrical connection with the central bar or rod 99, and the outer headed ends of said branch rods or bars projecting into or through the central perforation in the plate 96 within the cavities 39, where they form the opposite terminals of the sockets to be formed in said cavities to that formed by the shell 16 within said cavities. The frame of the extension is preferably provided with a protecting outer casing 103, made of metal or other suitable material, which outer casing is insulated from the shell 1 of the plug end, also from the shells 16 within the cavities 38 and 39. This outer casing is made in sections, which are secured together by screws or other devices when said casing is in place. The outer casing is provided with perforations coinciding with but preferably larger than the cavities 38 and 39, thus admitting of the insertion of a plug end of a lamp or other article into sockets contained within said cavities without contacting with the outer casing.

By the use of my extension, as above described, it will be seen that a plurality of lamps or other articles having plug ends with opposite terminals thereon may be attached to a socket which was originally designed to receive one article only, that the several articles which may be attached to the sockets formed therein will be arranged in multiple, and that any one or more of the sockets may be used, as is desired.

Thus far I have described my plug and socket extension, in which sockets with two

terminals or poles are formed; but it is equally adapted for sockets with one terminal or pole only. I have also shown and thus far described the plugs and sockets as being connected by a screw-threaded joint; but sockets and plugs which are to be connected in other ways may be used in my invention without departing from the spirit thereof, and I have shown socket and plug with a single terminal and adapted to be connected in another way than by a screw-threaded joint in Figs. 15 to 20. In this construction of my invention I prefer to provide the extension with a plug end arranged and constructed as described in relation to the other views of the drawings, the same having an externally-screw-threaded shell 1 and a metal piece 2, made in the form of a head on the bolt 58. I also provide the extension with a cavity 38 at the end opposite to the plug end and introduce an internally-screw-threaded shell 16 within said cavity and a screw 30, the shell 16 and screw 30 forming the opposite terminals of the socket formed in the cavity 38. Within vertical perforations in the body or frame 104 of the extension are placed the metal rods or bars 105 and 106. The upper end of the rod 105 is connected to a metal piece 107 on the shell 1 of the plug end by means of the screw 108 or equivalent device. The lower end of the rod 105 is in electrical connection with the metal piece 109, attached to or made in one piece with the shell 16 in the cavity 38 by means of the screw 110 or equivalent means. It will thus be seen that the shells 1 and 16 are in electric connection with each other through the rod 105. To the upper end of the rod 106 is connected the metal plate 111, which is placed within a horizontal recess in the frame of the extension and into which the screw-threaded end of the rod 58 is screwed. The screw 30 is screwed into one end of the metal plate 112, which is placed within a horizontal recess in the frame of the extension and has its opposite end attached to the rod 106. It will thus be seen that the metal piece 2 is in electric connection with the screw 30. Thus the socket in the cavity 38 has two terminals, and if a lamp or other device using electricity should be connected to the socket in said cavity said lamp would be lighted. The frame of the extension is provided with two series of recesses or cavities 113 and 114, which extend horizontally from the exterior of the frame toward the respective rods 105 and 106. These cavities are preferably arranged so that they radiate in horizontal planes with the centers of the rods 105 and 106 as the centers of radiation for the two series of cavities. Within the cavities 113 and 114 are placed the respective metal shells 115 and 116, which are secured to the respective rods 105 and 106, and these shells are split longitudinally, so that they will form spring-sockets and will retain a plug 117 in contact therewith by friction.

tion alone. As the shells 115 and 116 are each in connection with but one of the rods 105 or 106, it will be seen that each of the sockets formed by said shells will be a single-
 5 pole-socket, those being connected to the rod 105 being of one polarity, while those connected to the rod 106 are of an opposite polarity, and that it will be necessary to introduce a plug end into one of the shells con-
 10 nected to each of the rods 105 and 106 in order to complete a circuit. The preferred form of shells and plug ends to be used in this construction of my improved socket and plug extension have been shown in detail in Figs.
 15 17 to 20, inclusive, the construction of the shell having been described and that of the plug end consisting of a straight piece of metal 117, which substantially fits the interior of the shell, being slightly larger than the
 20 interior of the shell, so as to cause sufficient friction to keep the plug within the shell.

Having thus fully described the nature, construction, and operation of my invention, I wish to secure by Letters Patent and claim—

25 1. In an extension to an electric coupling, a frame or body with cavities and projections forming respectively a plurality of socket portions and a plurality of plug portions of a plurality of electric couplings thereon, a
 30 metal shell and a metal piece, insulated from each other, arranged within each cavity and on each projection constituting opposite terminals of a socket or plug formed in said cavity and on said projection, and electric con-
 35 ductors within said frame or body permanently connecting a terminal of one socket or plug with a terminal of another socket or plug, whereby each part of an electric coupling contained on the said frame will be within an
 40 electric circuit and ready to receive the other part of the coupling, in order to couple an electrically-operated device thereto and to supply it with electricity, for the purpose set forth.

45 2. In an extension to an electric coupling, a frame or body with projections forming plug portions of electric couplings thereon, two metal pieces on each projection insulated from
 50 each other forming electric terminals thereon, and electric conductors within said body or frame permanently connecting each terminal on each projection with a terminal on another projection, whereby each part of an electric
 55 coupling contained on the said frame will be within an electric circuit and ready to receive the other part of the coupling, in order to couple an electrically-operated device thereto and to supply it with electricity, for the purpose set forth.

60 3. In an extension to an electric coupling, a frame or body with cavities forming socket portions of electric couplings therein, two metal pieces in each cavity insulated from each other forming electric terminals therein,
 65 and electric conductors within said body or

frame permanently connecting each terminal in each cavity with a terminal in another cavity, whereby each part of an electric coupling contained on the said frame will be within an
 70 electric circuit and ready to receive the other part of the coupling, in order to couple an electrically-operated device thereto and to supply it with electricity, for the purpose set forth.

4. In an extension to an electric coupling, a
 75 frame or body with cavities and projections thereon, two metal pieces in each cavity and on each projection insulated from each other and forming opposite electric terminals, electric conductors within said body or frame per-
 80 manently connecting each terminal of each cavity or projection with a terminal in another cavity or projection combined with detachable arms having a plug and socket there-
 85 on to engage the terminals in each of said cavities or on each of said projections, whereby a self-contained complete and portable chandelier with detachable and interchangeable arms is formed, for the purpose set forth.

5. In an extension to an electric coupling, a
 90 body or frame, with grooves, projections and cavities thereon, a screw-threaded metal shell in each cavity and on each projection forming an electric terminal, a central metal piece in each cavity and on each projection forming
 95 an opposite terminal to those formed by the metal shell, metal washers in said cavities to which the metal shells are attached, and metal strips within said grooves connecting said
 100 washers, forming electric conductors within the body of the extension and holding the metal shells within said cavities, for the purpose set forth.

6. In an extension to an electric coupling, a
 105 body or frame with grooves, projections and cavities thereon, metal shells and central metal pieces forming electric terminals, and conductors within said frame connecting a part of said terminals in series and a part of
 110 said terminals in parallel, whereby electric devices of various resistances may be connected to the same extension, for the purpose set forth.

7. In an extension to an electric coupling, a
 115 body or frame with grooves, projections and cavities thereon, metal shells and central metal pieces forming electric terminals, and conductors within said frame connecting said terminals in combined series, multiple and
 120 multiple series, for the purpose set forth.

8. In an extension to an electric coupling, a
 125 body or frame, a projection on one end, a metal shell and a central metal piece on said projections forming electric terminals thereon; a cavity in the opposite end of the frame of the extension, a metal shell and a central metal piece within said cavity forming electric terminals in said cavity; and conductors within said frame connecting the terminals
 130 on said projection with those in said cavity;

series of cavities on the sides of said frame, a metal shell and a central metal piece within each side cavity forming electric terminals therein; and conductors within the frame connecting the terminals in the side cavities and the terminals on the projection, whereby the terminals on the projection may be connected with the terminals of a source of electricity and the terminals on electrically-operated de-

vices be connected to the terminals in the several cavities, for the purpose set forth.

In testimony whereof I have affixed my signature in presence of two witnesses.

WILLIAM H. KELSEY.

Witnesses:

HENRY CHADBURN,
ARTHUR C. JONES.