

Feb. 14, 1933.

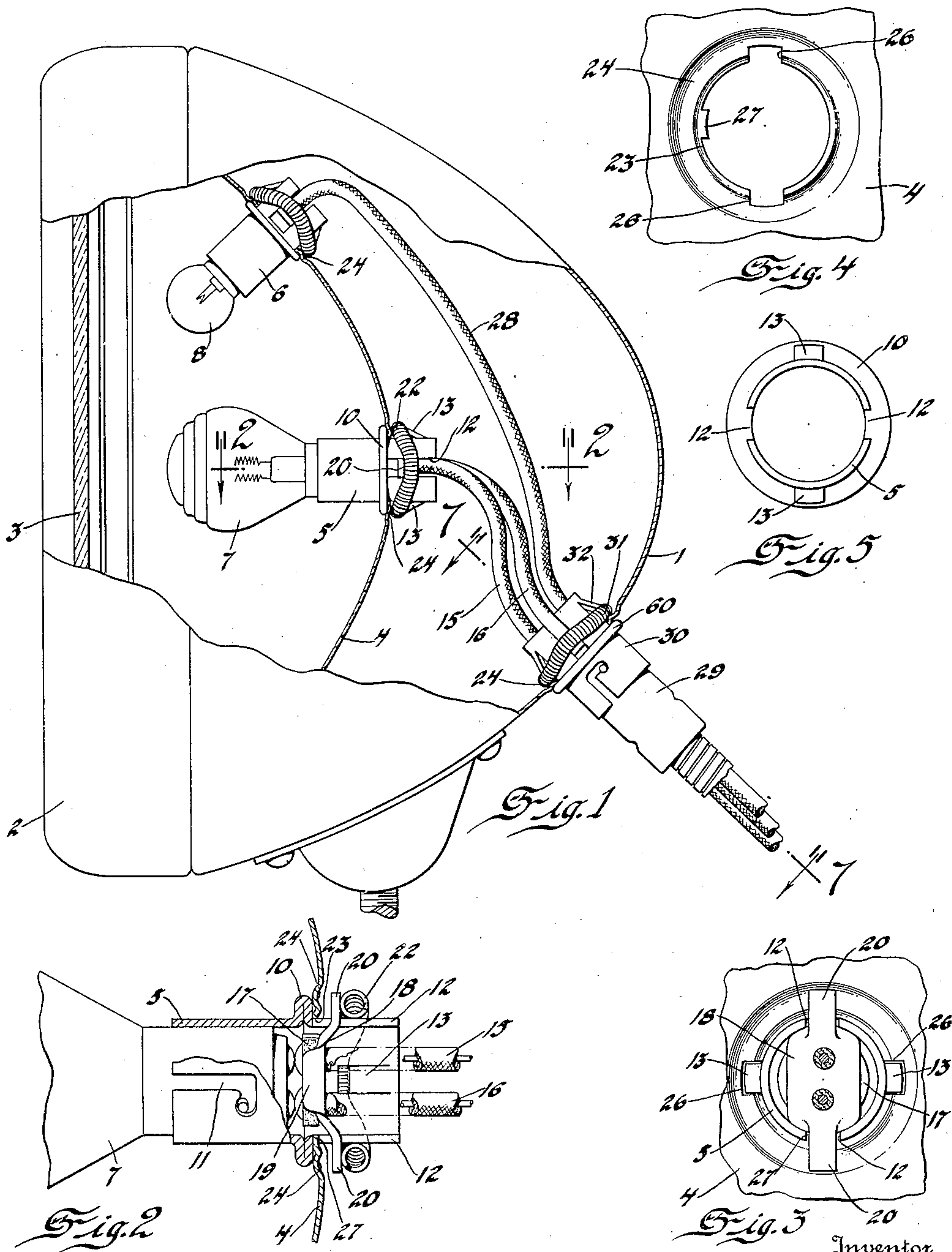
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1,897,797

LAMP SOCKET

Filed Nov. 4, 1929

2 Sheets-Sheet 1



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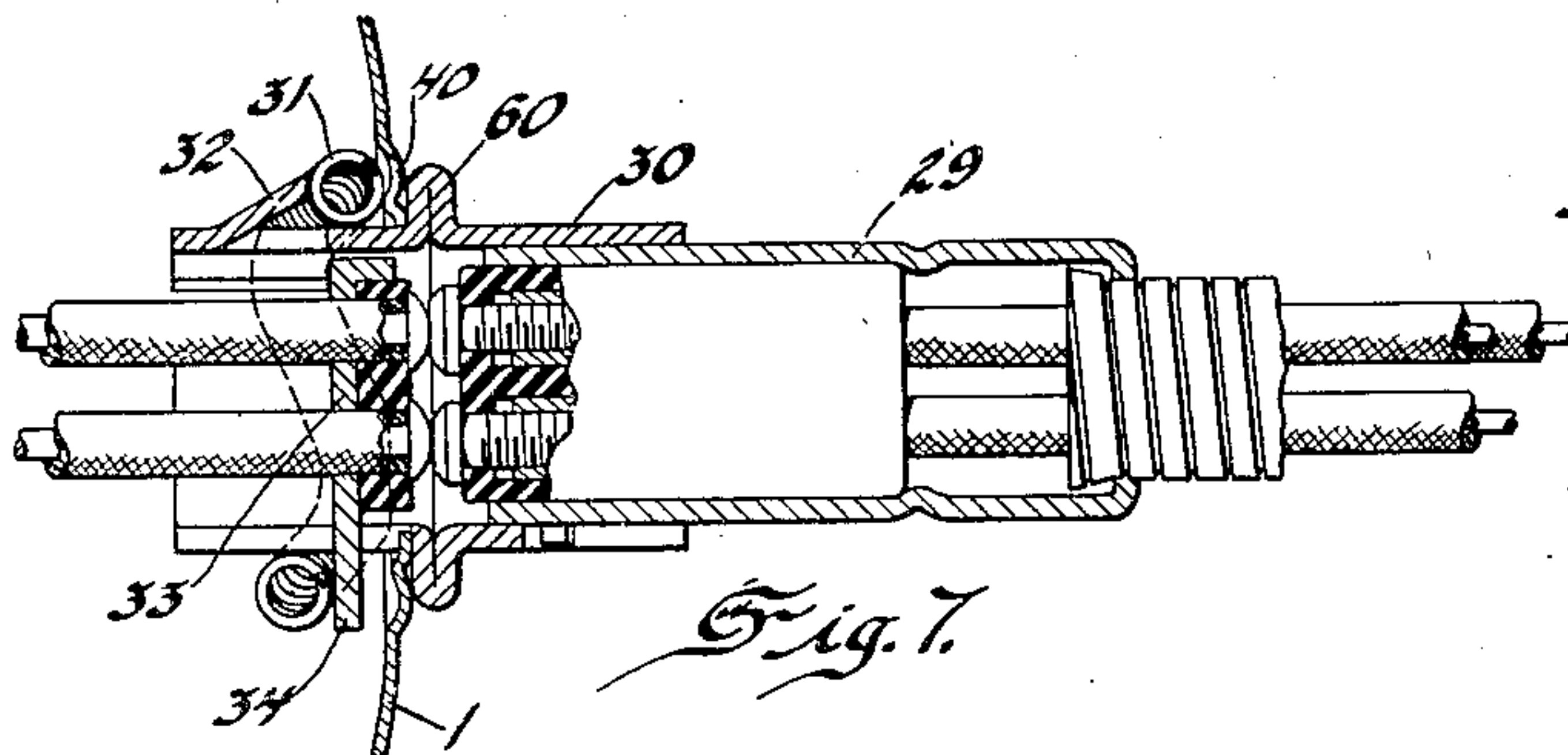


Fig. 7.

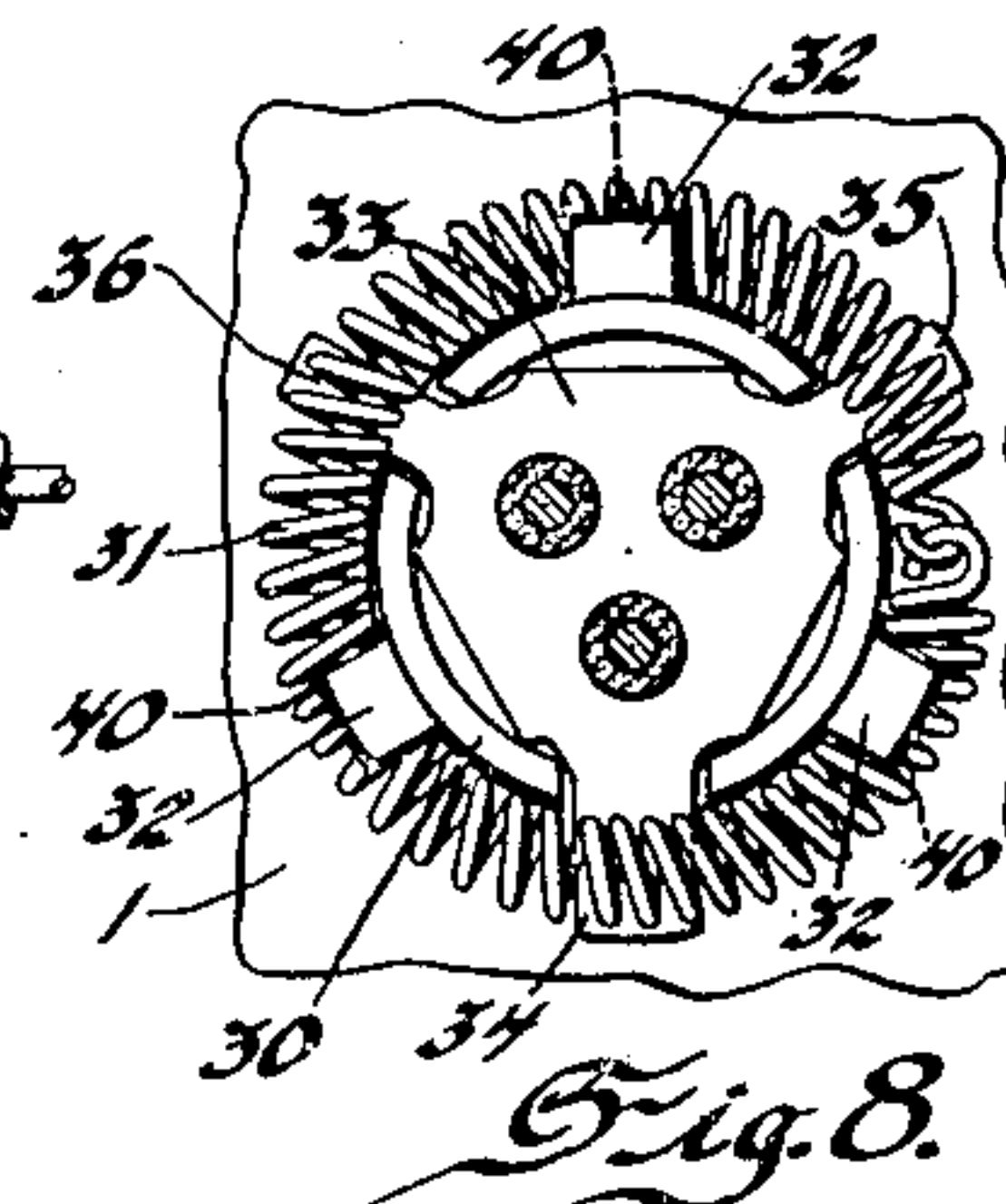


Fig. 8.

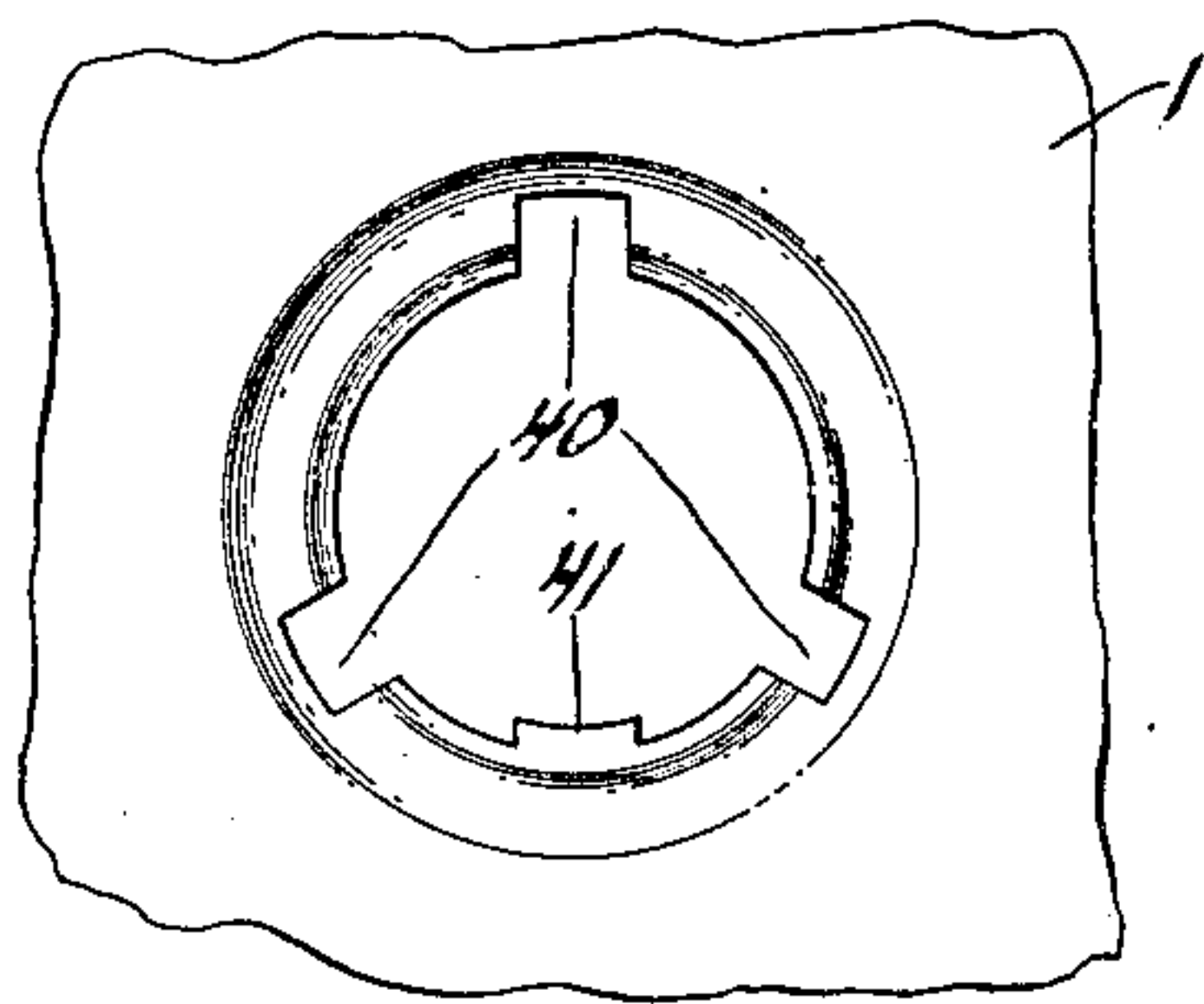


Fig. 9.

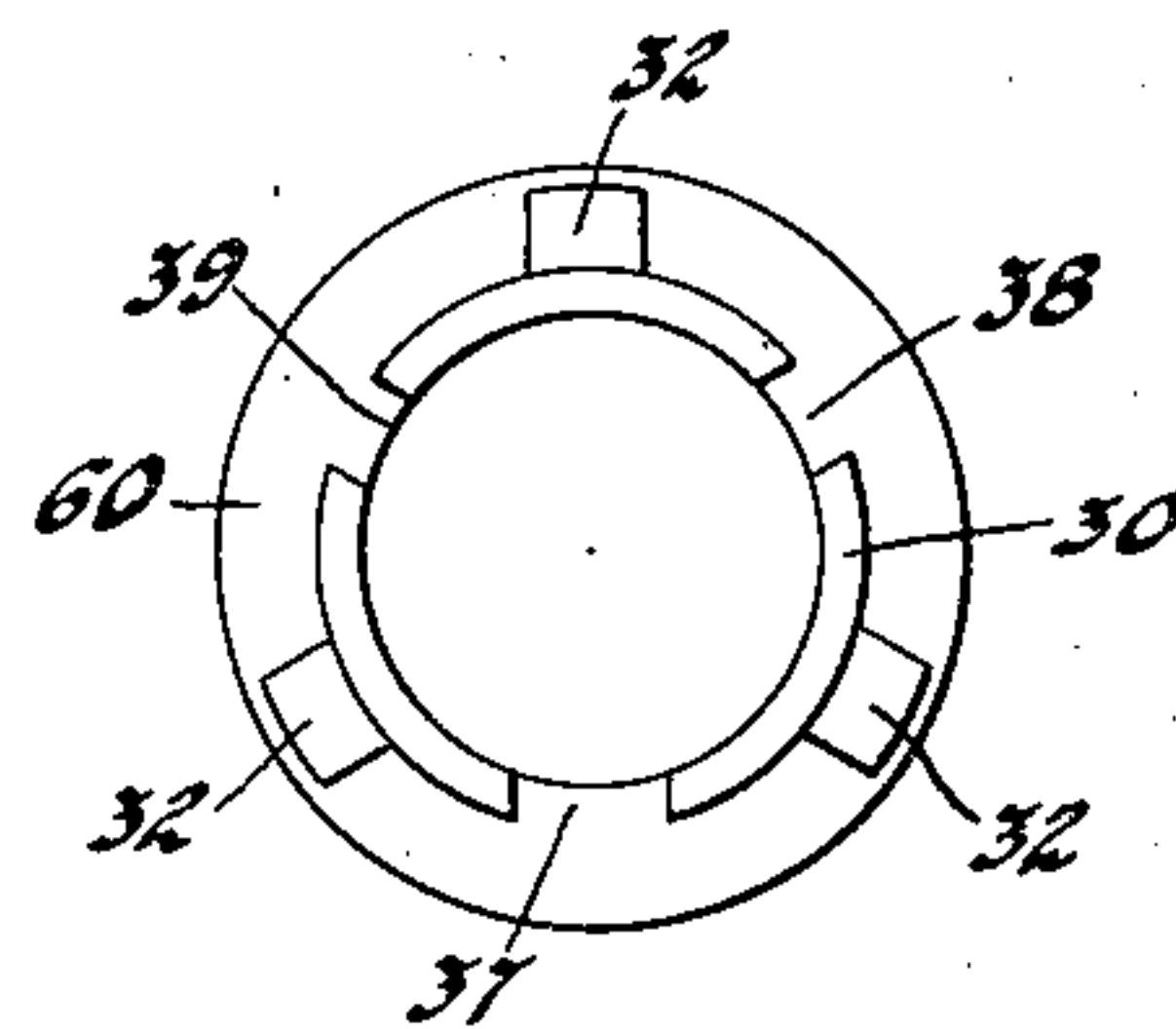


Fig. 10.

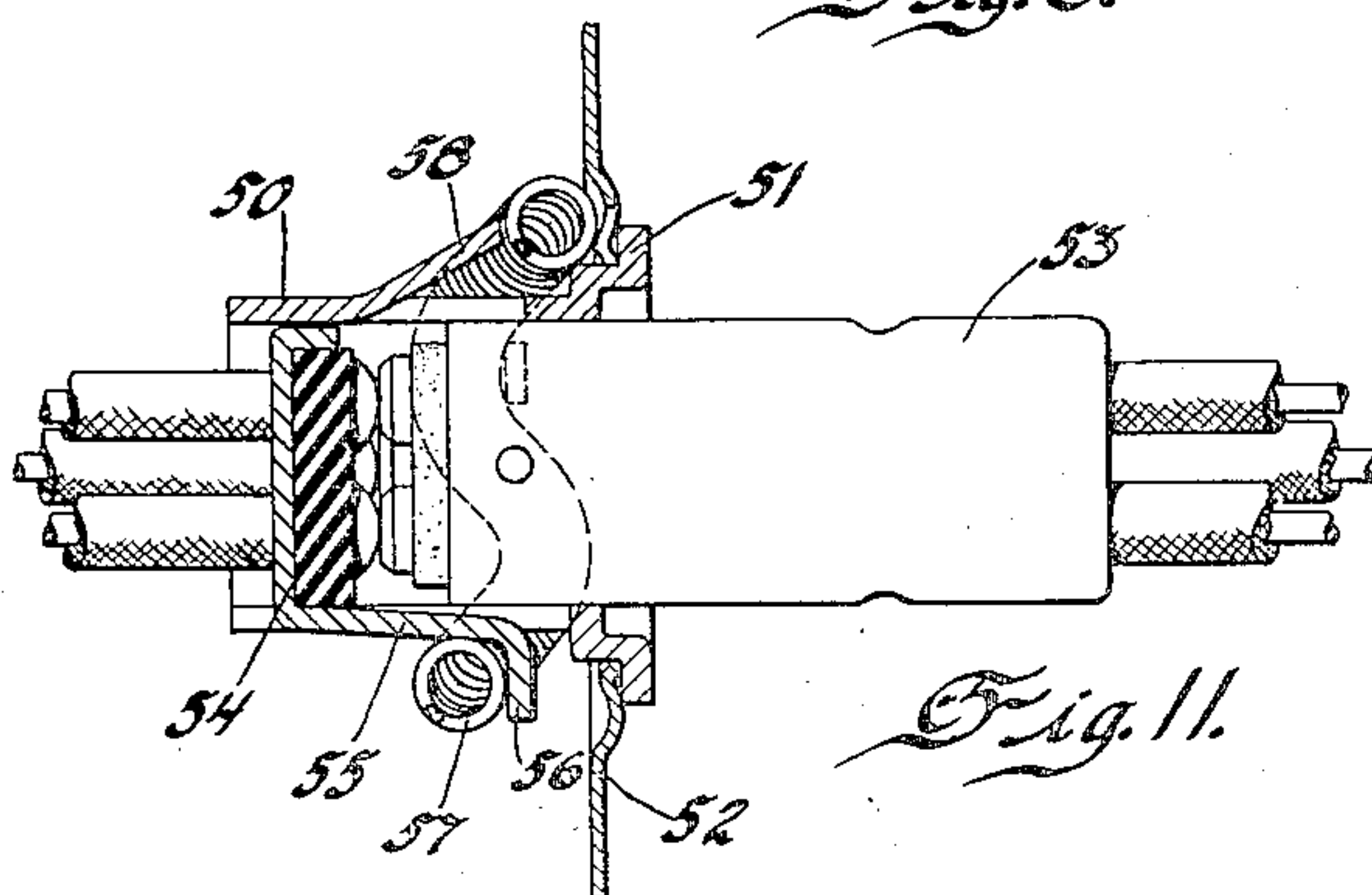


Fig. 11.

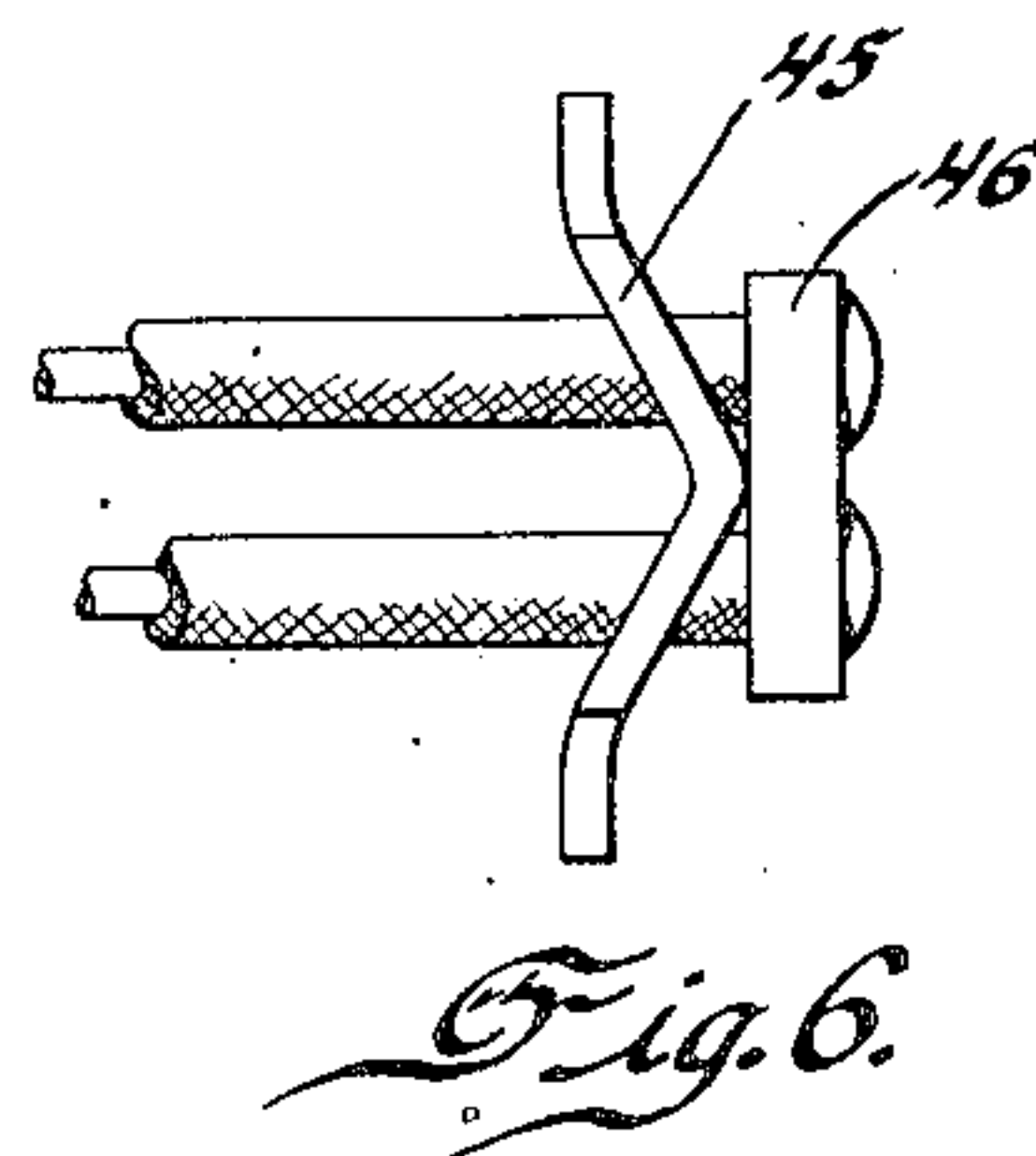


Fig. 6.

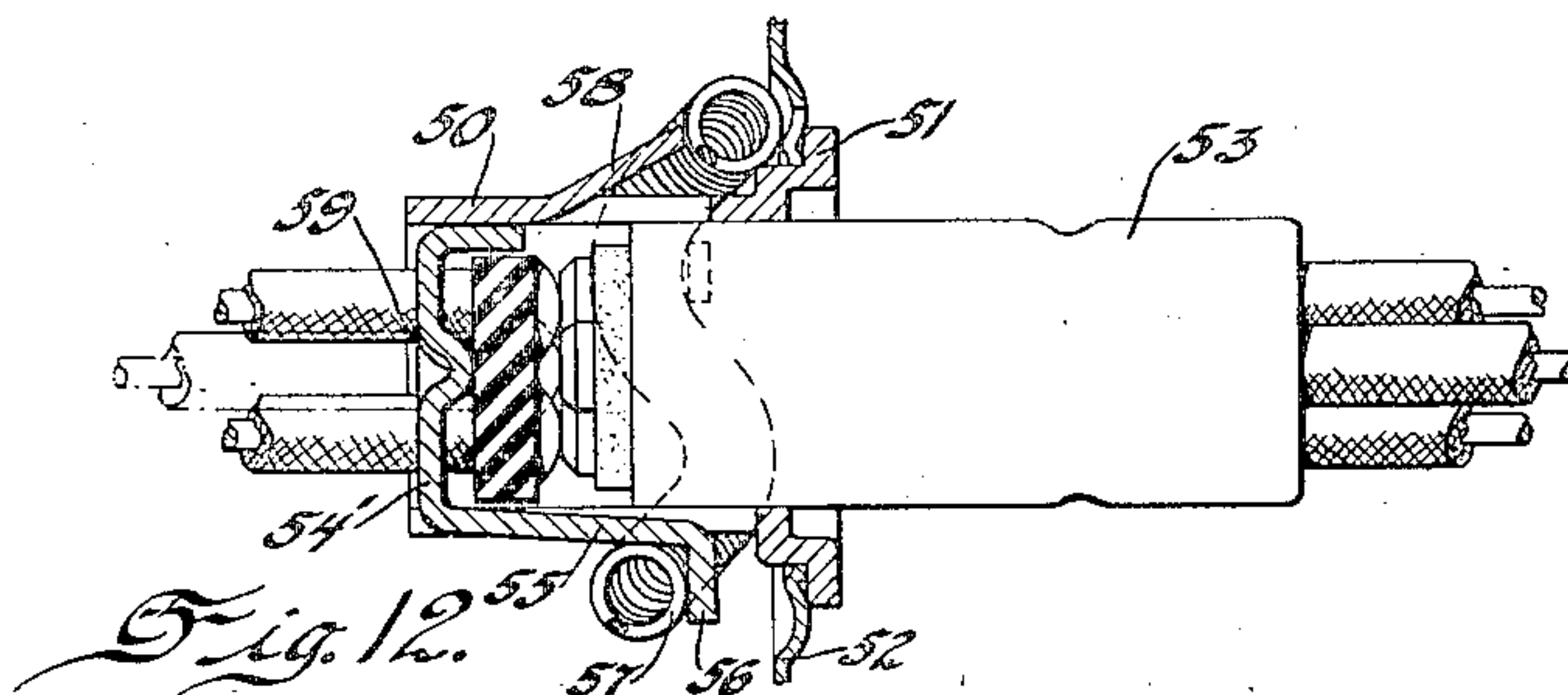


Fig. 12.

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## UNITED STATES PATENT OFFICE

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## LAMP SOCKET

Application filed November 4, 1929. Serial No. 404,727.

This invention relates to electrical apparatus and more particularly to an improvement in connector parts and while not limited in its application, it has been especially designed for use with automobile lamps, and for the purposes of disclosure will be so referred to herein.

It is one of the primary objects of the invention to provide a very simple connector socket which may be made at small cost of a few easily formed parts and assembled and installed with a minimum expenditure of time and effort by the ordinary unskilled workman.

A further object of the invention is to provide a new and improved type of mounting for the socket whereby the socket may be rigidly held in fixed relation with the reflector or other supporting wall, through which it projects, without requiring threading together of cooperating parts or other expedients involving fine adjustments or complicated attachment devices.

Another object is to provide a socket, wherein the attachment means consists of a contractable spring wedged by its contraction between adjacent cooperating parts of the supporting wall and socket to hold the parts together, and which is provided with a movable contact device having portions engageable with the mounting spring and yieldingly held by the spring in tight electrical engagement with the part that is removably receivable in the socket; the single spring thus serving a double function.

Additional objects and features of advantage will be apparent upon reference to a specific embodiment of the invention as hereinafter described and shown on the accompanying drawings.

In the drawings:

Fig. 1 is a side elevation with parts broken away and shown in section of a head lamp illustrating an application of the invention.

Fig. 2 is a detail sectional view taken on line 2—2 of Fig. 1.

Fig. 3 is a rear elevation of the parts shown in Fig. 2 with the spring element removed.

Fig. 4 is a fragmentary elevation showing

a portion of the supporting wall through which the socket extends.

Fig. 5 is an end view of the socket shown in Fig. 1.

Fig. 6 is a detailed view illustrating a slight modification of the movable contact element of the socket.

Fig. 7 is a sectional view taken on line 7—7 of Fig. 1.

Fig. 8 is an end elevation looking toward the right in Fig. 7.

Fig. 9 is an elevation of the supporting wall shown in Fig. 7.

Fig. 10 is a detail view showing the socket of Fig. 7 in end elevation.

Fig. 11 is a sectional view illustrating a modified form of socket.

Fig. 12 is a sectional view of a further modification.

Referring to the drawings, the reference numeral 1 indicates a lamp housing or casing having a rim 2 removably secured at the front thereof to carry the lens 3 over the reflector 4. Carried by the reflector 4 are two sockets or sleeves 5 and 6 for the light bulbs 7 and 8 respectively, received and held in the sockets as by means of bayonet slot connections. The bulb 8 contains a single filament and is for parking light purposes, while the bulb 7 furnishes light for driving purposes and is shown with two filaments, giving bright and dim lights respectively. The sockets 5 and 6 are substantially the same except for dimensions and the number of circuits involved, and for this reason only one need be described in detail.

Considering the socket 5, it will be seen from the detail view Fig. 2, that the socket consists of a sleeve or tube of light gage sheet metal having between its ends an annular bead or peripheral abutment shoulder 10 which for economy and convenience of manufacture may be formed by bending intermediate portions of the sleeve upon each other. The forward portion of the sleeve may be formed with bayonet slots as at 11 to receive the plug or base of the light bulb 7, while the rearward portion of the sleeve is shown as having a pair of diametrically opposite slots or notches 12 extending in a



straight line from the rear edge of the sleeve to the projection or shoulder 10. Spaced circumferentially from the slots 12 and substantially midway therebetween are a pair of diametrically opposite ears or tabs 13 preferably formed by pressing the metal of the sleeve outwardly and which are spaced axially from the shoulder 10.

Within the socket is an axially movable contact element carrying the terminals of the current conducting wires 15 and 16 for engagement with the contacts of the light plug. This contact element may consist of a disc or washer 17 of suitable insulating material and a backing plate or disc 18 having its side portions bent forwardly to form a pair of flanges 19 between which the washer 17 is held. The backing plate is also provided with a pair of radial or laterally extending ears or fingers 20 projecting through the slots 12 and beyond the peripheral surface of the sleeve.

The contact element and sleeve are held in assembled relation and the sleeve is fixed in the reflector 4 by means of a single elastic element or annular spring 22 preferably formed of coiled piano wire which surrounds the sleeve bearing against the back of the fingers 20 and lying between the tabs or projections 13 and the adjacent surfaces of the supporting wall or reflector 4. Adjacent the opening 23 in the reflector through which the sleeve extends there is formed an annular depression 24 which forms a seat for the spring between which seat and the ears 13, the spring 22 wedges itself because of its contractive tendency. This wedging action draws the shoulder 10 into firm engagement with the front surface of the reflector and holds the sleeve firmly in place and rigid with the reflector. The portion of the depression that overhangs the periphery of the spring acts as a lock to prevent the spring from being accidentally moved out of the space between the cooperating portions or seat 24 and ears 13. In addition to holding the socket in place, the spring 22, by its engagement with the rear faces of the ears 20, yieldingly resists axial movement of the contact element toward the rear and tends to urge it forward into firm engagement with the contacts of the inserted plug to insure a tight electrical connection.

In assembling the socket in the lamp, the sleeve 5 is inserted through the opening 23 from the front side of the supporting wall, there being provided in the wall at the opening a pair of grooves or notches 26 to permit the passage of the upstanding ears 13. There is also provided an inward extension or tab 27 to project into one of the slots 12 of the sleeve to key the sleeve with the reflector and prevent its rotation therein. The contact element with the wires 15 and 16 attached thereto, is then inserted into the rear of the sleeve with its ears 20 sliding in the slots 12, after

which the annular coil spring is placed around the rear portion of the sleeve and moved forward so that it rides up the inclined ears 13 and drops into the space beyond the ears between the ears and depressed seat 24 of the reflector.

It will be understood that since the parking light bulb 8 has but a single contact on its base, the movable contact element or terminal carrier of the sleeve 6 carries only the terminal for the single wire 28 leading thereto. The construction and arrangement of the parts may be otherwise as before described.

The socket in the lamp housing for the detachable plug or connector 29 carrying the lead-in wires may be constructed in much the same manner as the head lamp socket previously described. It is shown as being made slightly different merely to take care to better advantage of the three current conducting wires 15, 16 and 28. As shown in the detail view, Fig. 7, the sleeve 30 is secured to the wall of the lamp housing 1 by the coil spring 31 interposed between the depressed seat in the wall and the circumferentially spaced struck-out tabs or ears 32 of which there are three, whereby the intermediate peripheral bead 60 is clamped tightly against the outside face of the wall. The contact element 33 for the terminals of the three wires in this case is shown as being provided with laterally projecting ears 34, 35 and 36 projecting through spaced slots 37, 38 and 39 in the sleeve for engagement with the spring 31. To insure the proper positioning during assembly, of the movable contact element 33 and the terminals carried thereby, the ear 34 may be made larger than the ears 35 and 36 so that it will fit only in the slot 37 which in turn is made larger than the slots 38 and 39. The assembly of the parts is from the outside of the housing, the opening in the wall for the sleeve being cut away as at 40 to allow the passage beyond the wall of the struck-out portions 32. To prevent the sleeve turning in the aperture, the inwardly directed tongue 41 may be provided for projection into the slot 37.

In those cases where the contact element used carries two or more terminals it may be found desirable to employ the arrangement illustrated in Fig. 6, wherein 45 indicates a V-shaped member which contacts at its ends with the spring, and fulcrums at the apex of the V on the contact carrier 46. This scheme is intended to take care of slight inaccuracies in manufacture, particularly where the terminals differ in size, and allow a fulcrum action between the members 45 and 46 upon the application of spring pressure to secure tight electrical contact of the terminals.

It may not be desirable, under certain conditions, to have the sleeve project beyond the face of the supporting wall when the connector plug is removed, and to meet such con-



ditions the arrangement shown in Fig. 11 may be employed. In this case, the sleeve 50 terminates at its outer end in a lateral flange 51 contacting with the front face of the supporting wall 52, and the connector plug 53 extends into the sleeve beyond the wall into engagement with the cup shaped contact element 54, which may be provided with two or more forwardly projecting arms or legs 55, each having a lateral flange portion 56 for engagement with the coil spring 57 that holds the socket in place by its wedged engagement between the wall 52 and a series of spaced struck-out portions or abutments 58, as in the manner previously described.

In some instances it may be desirable to substitute the backing plate 54' as shown in Figure 12 for that illustrated in Figure 11, wherein the difference lies in the provision of a fulcrum boss 59 for point engagement with the contact element, the purpose being to allow a pivotal movement of the contact element to ensure good contact of the three terminals without side movement.

The device described above, while being very simple and economical in structure and easy to assemble and install, affords a rigid mounting for the socket and insures and maintains a good electrical connection between the contacts. While parts have been referred to more or less specifically, it is to be understood that the invention is not limited to the exact details shown, but that such modifications and variations may be made as come within the scope of appended claims.

I claim:

1. Electrical connector parts, including in combination with a support, of a socket, a movable contact element in said socket, and a single resilient means to hold the socket and support in assembled relation and to yieldingly resist movement of the contact element in the socket.

2. Electrical connector parts, including in combination with a support, of a socket, a movable contact element in said socket, and a single resilient means adapted both to hold the socket rigid with the support and to offer yielding resistance to movement of the contact element.

3. Electrical connector parts, including in combination with a support, of a socket, a movable contact element in said socket, and a spring device engageable with cooperating spring abutment portions on the socket and support respectively to hold the socket rigid with the support, and also engageable with the movable contact element to yieldingly resist its movement.

4. Electrical connector parts, including in combination with a support, of a socket, a movable contact element in said socket, and a spring device engageable with a seat on the socket to hold the socket in assembled relation with the support and engageable with

the contact element to hold it in assembled relation with the socket, and offer yielding resistance to its movement.

5. Electrical connector parts including in combination with a supporting wall, of a socket extending thru an opening in the wall and comprising a sleeve having on one side of the wall a shoulder for abutment with the wall and a part for the detachable reception of a plug, and on the other side of the wall a series of circumferentially spaced lugs and a series of axially extending slots spaced circumferentially from each other and from said lugs, an axially movable carrier within the sleeve for the terminal of a wire to be connected with that of a plug received by the socket, a series of radial ears on the carrier corresponding to slots in said sleeve and projecting slidably therethru, and an annular contractable spring inserted between the said lugs and adjacent side of the wall in wedged relation and engageable between the lugs and on the side opposite that engaging the lugs with the ears in said slots to yieldingly resist movement of the terminal carrier in the sleeve away from the plug receiving part.

6. Electrical connector parts, including in combination with a supporting wall, a socket extending thru an opening in the wall and having a shoulder engageable with the front face of the wall and an abutment beyond the rear face of the wall, a contractable annulus surrounding the socket and wedging itself by reason of its contractive tendency between the rear face of the wall and said abutment to hold the shoulder in firm engagement with the front face of the wall, and an axially movable carrier within the socket for the terminal of a conductor wire at the rear of the socket which is to make contact with a part detachably received in the front of the socket, said carrier having two or more radial ears extending in front of the annulus for contact therewith upon rearward axial thrust of the carrier whereby the annulus yieldingly resists rearward movement of the carrier and urges it forward to insure tight contact of the terminal of the carrier with that of the detachable part.

7. Electrical connector parts, including in combination with a support, of a socket extending thru an opening in the support and having a pair of spaced projections located on opposite sides of the support respectively, an axially movable contact member within the socket having a lateral extension projecting thru a slot in the wall of the socket and slidable therein, and an annular contractable spring surrounding the socket and extending between the support and one of said projections in wedging relation to hold the other projection in contact with the support and engaging said extension to resist



axial movement of the contact member in one direction.

8. Electrical connector parts, including in combination with a support, of a socket having a projection thereon, a movable contact element in the socket having an extension projecting thru the socket, and a spring device having a portion wedged between the support and projection to hold the socket rigid with the support and another portion engaging said extension to yieldingly resist movement of the contact element.

9. Electrical connector parts including in combination with a support, a socket having a series of circumferentially spaced projections and a series of axially extending slots spaced circumferentially from each other and from said projections, an axially movable contact element within the socket, having lateral ears projecting thru said slots, and a contractable annular spring surrounding the socket, engaging on one side with said projections and on the other side with said ears, whereby to yieldingly resist movement of the contact element in one direction.

10. Electrical connector parts, including a supporting wall, a tubular socket to be supported thereon extending axially through an opening in the wall and having peripheral abutments in spaced relation to the wall, a contact part slidable in the socket and having projections extending through and beyond the wall of the socket and an elastic ring surrounding the tubular socket and lying in the space between the abutments and wall and engaging said projections.

In testimony whereof I affix my signature.

CHARLES E. GODLEY.