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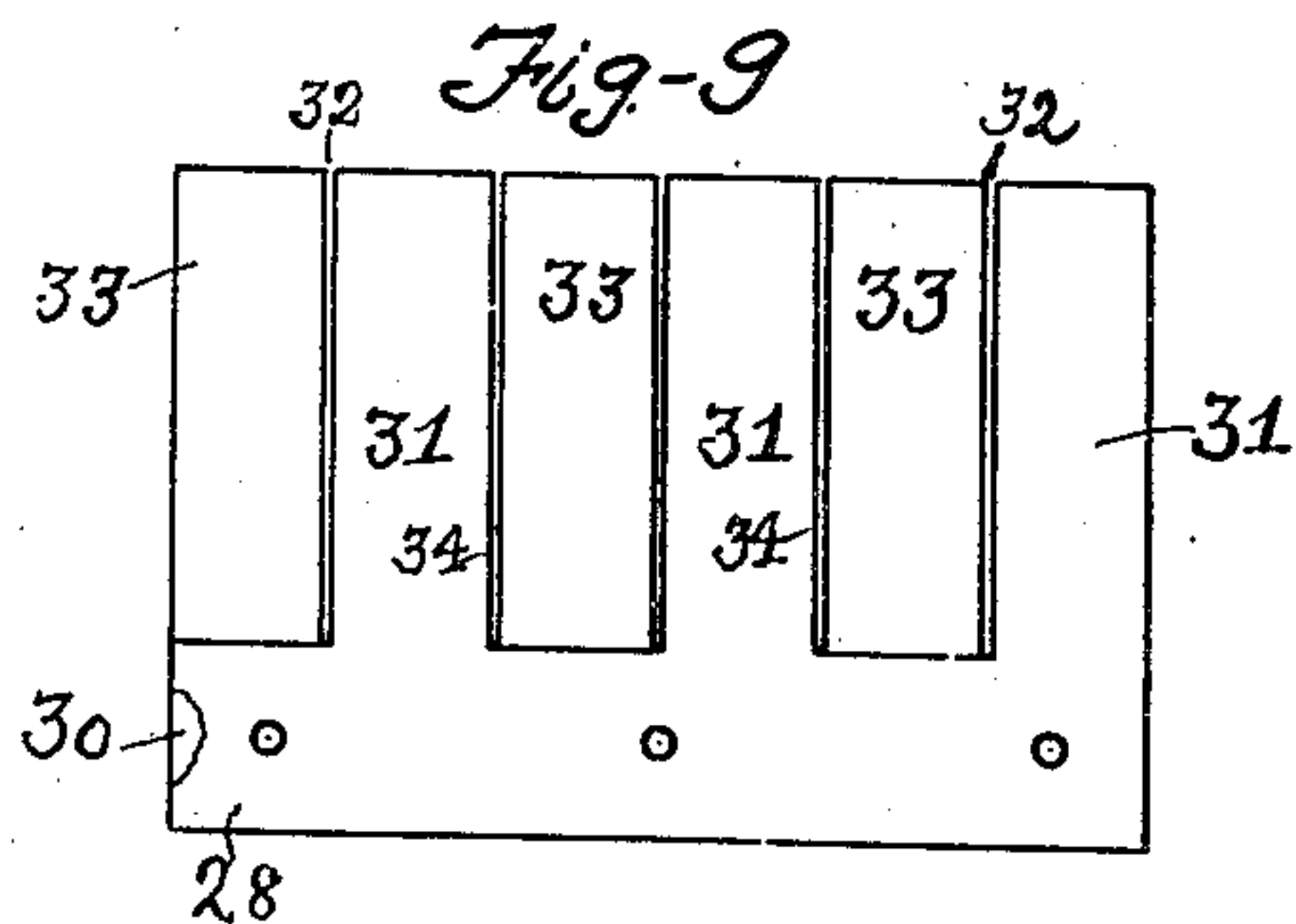
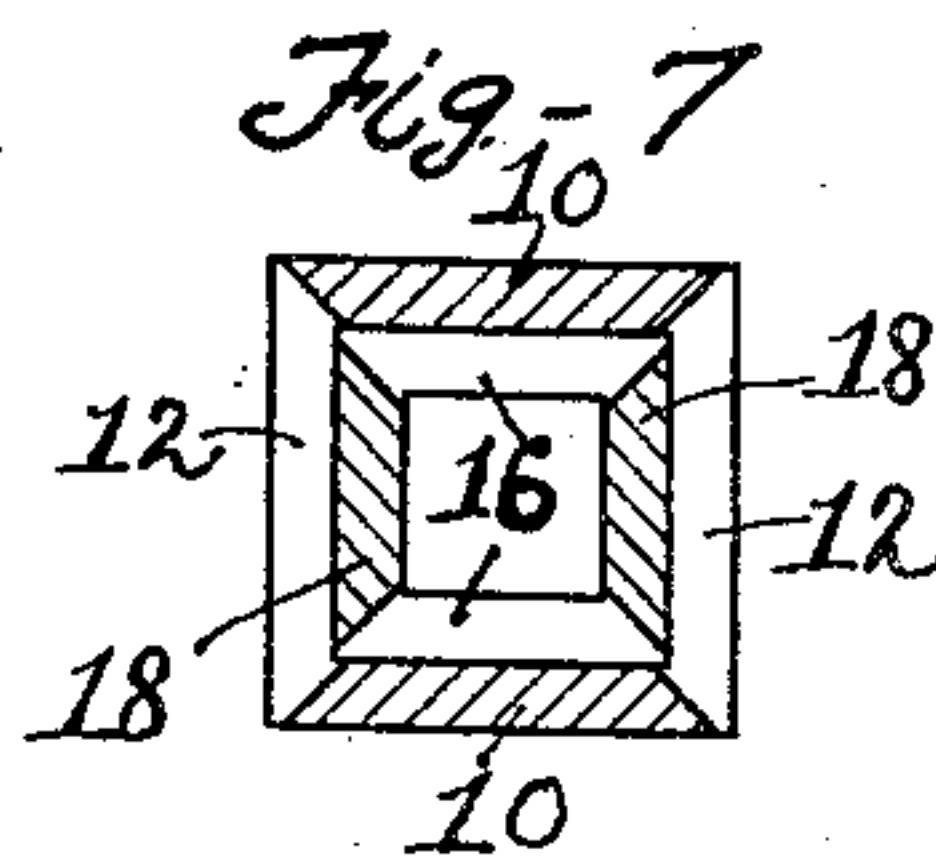
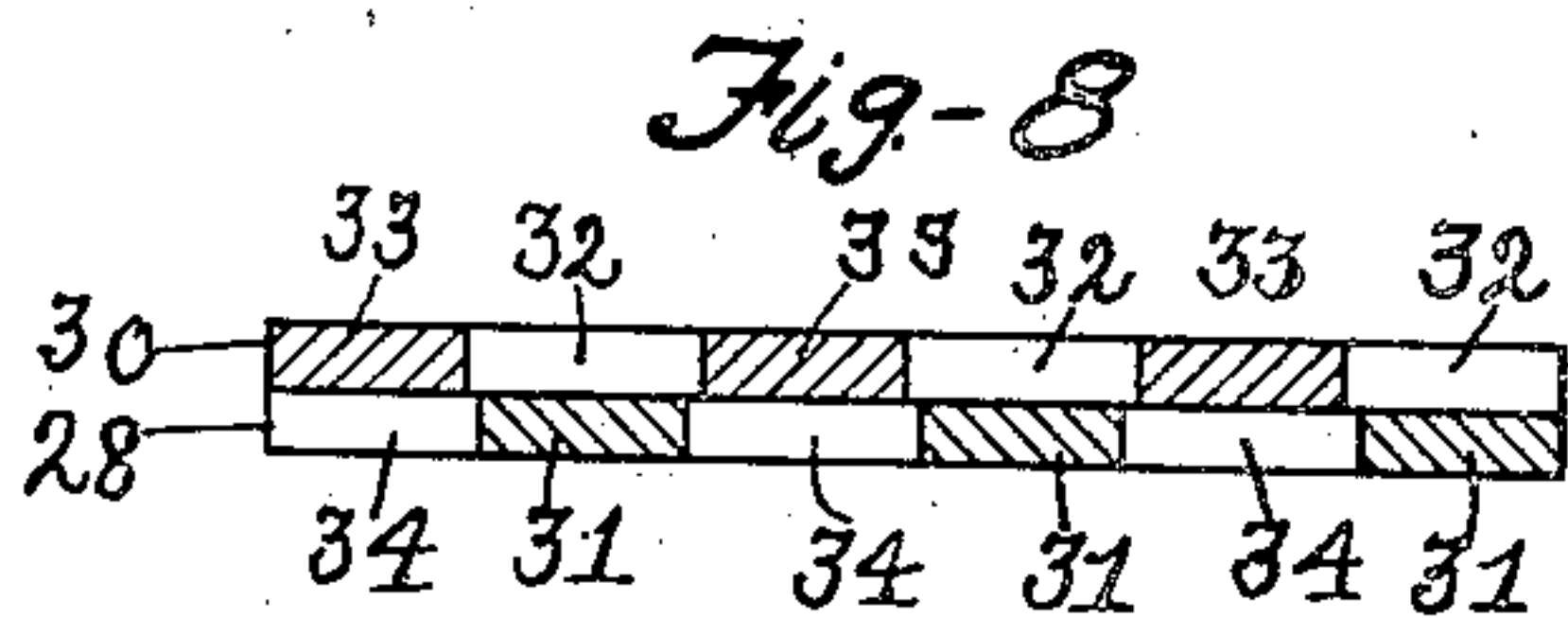
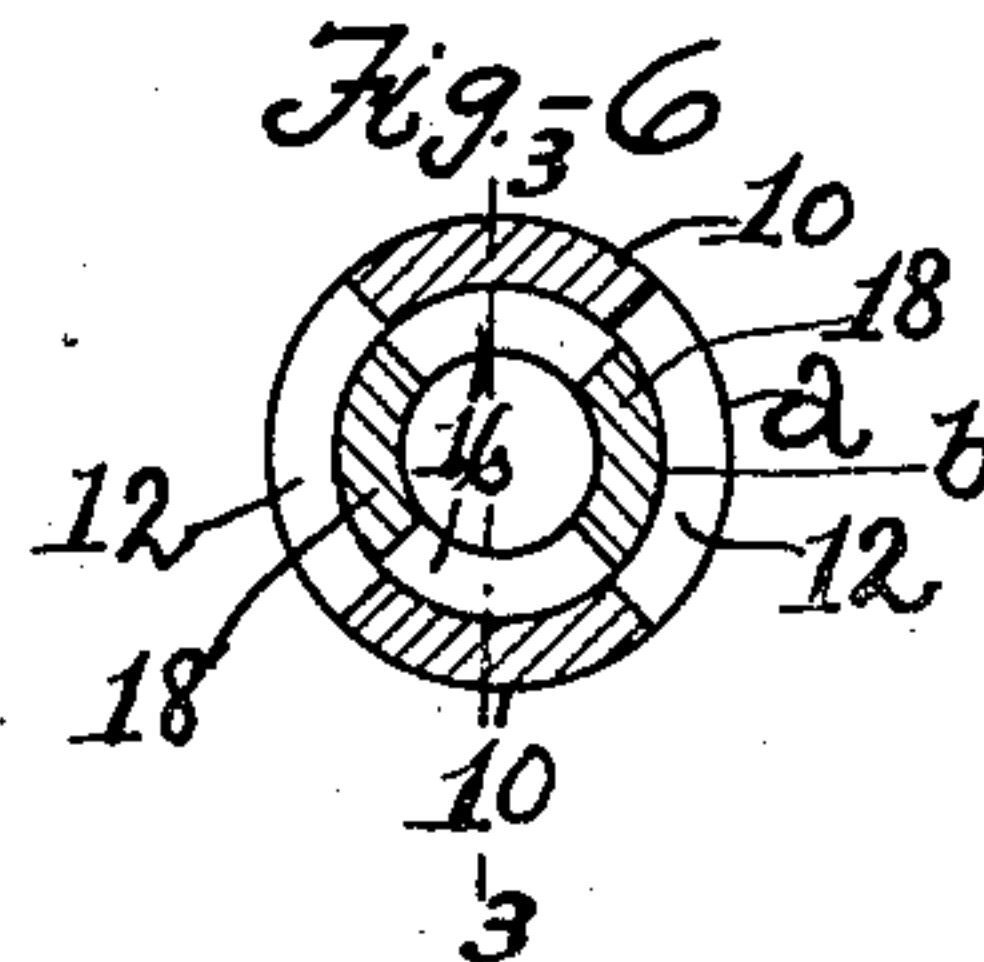
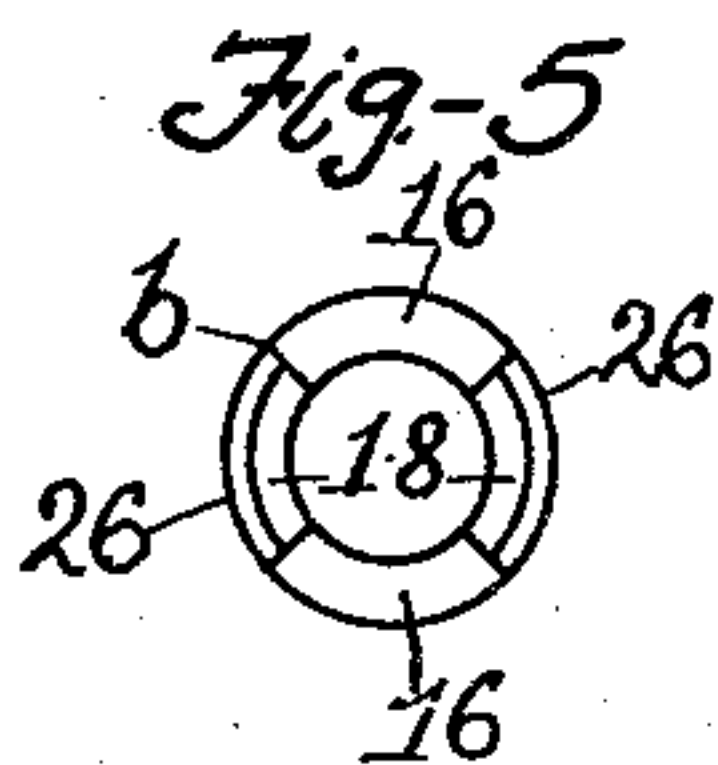
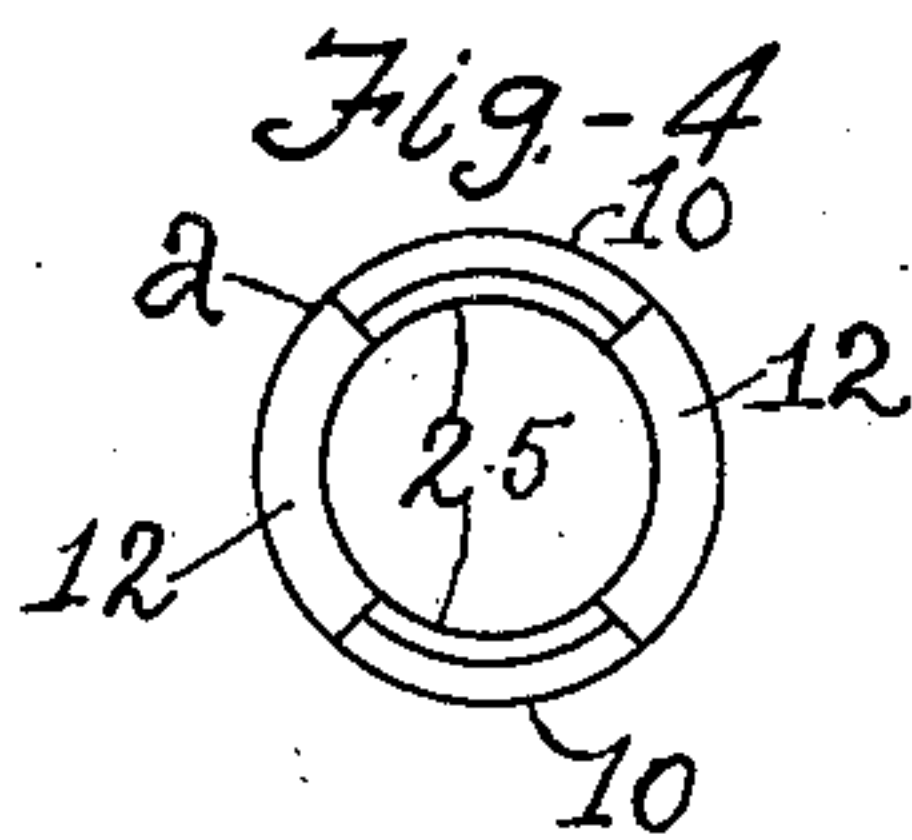
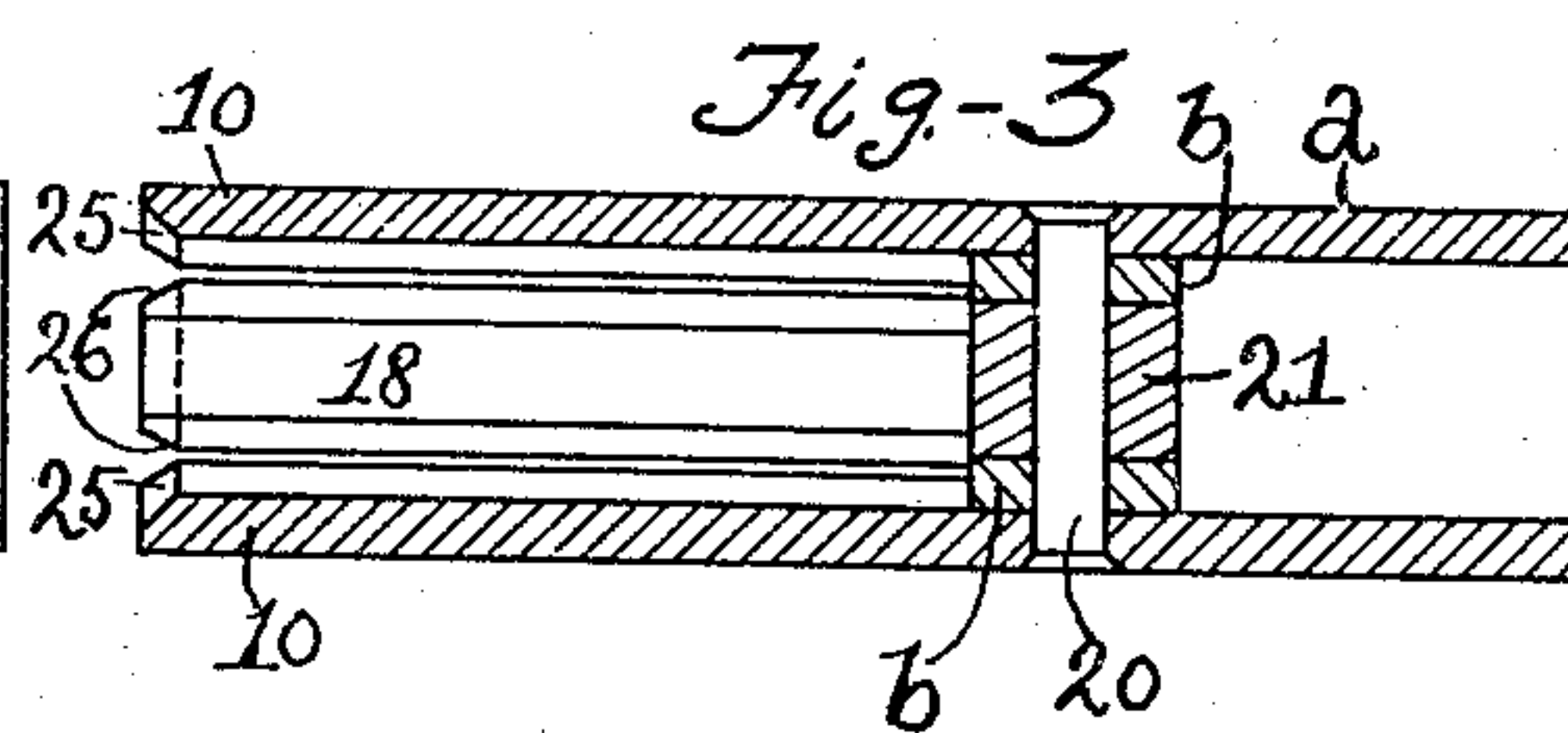
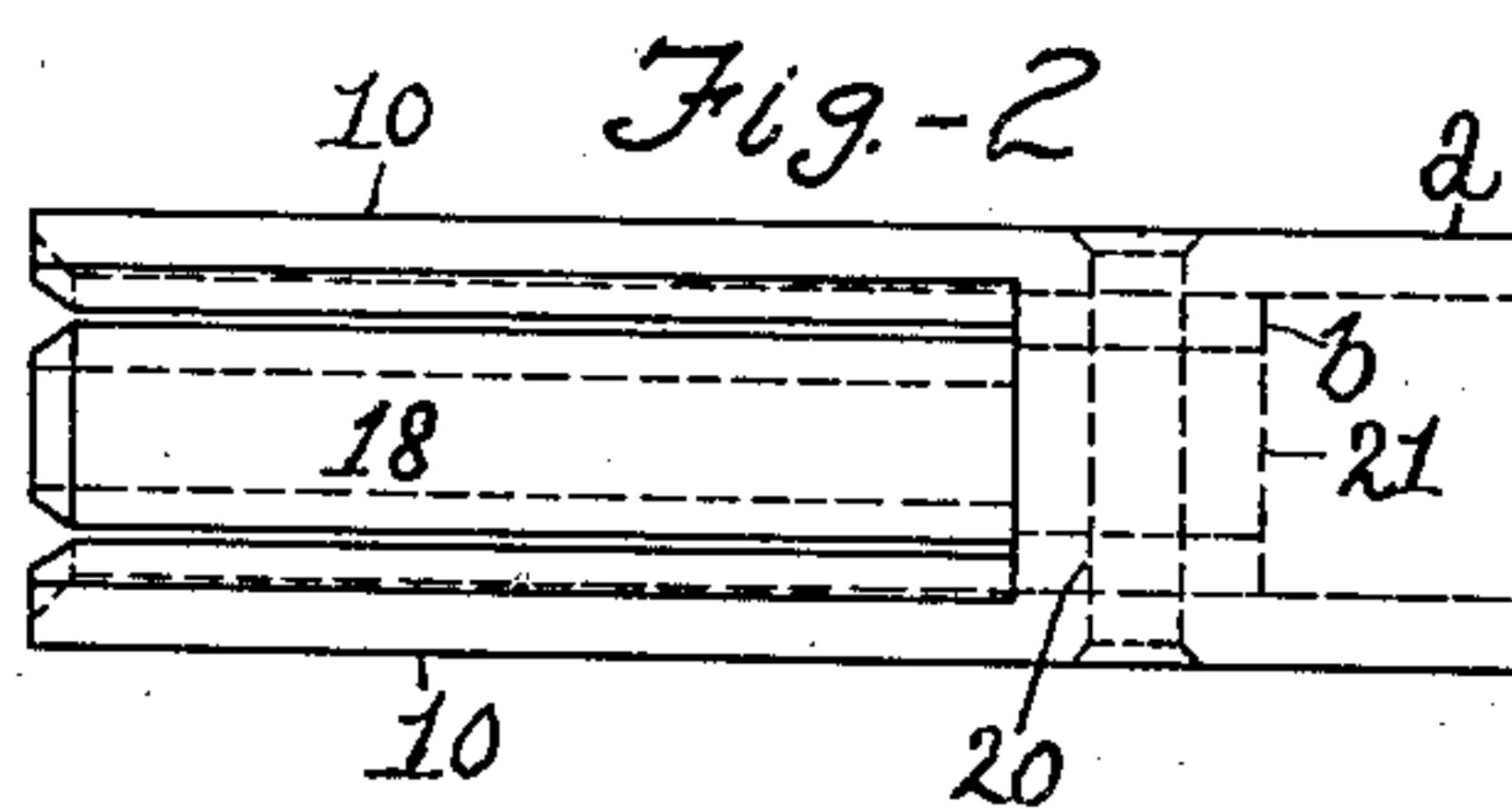
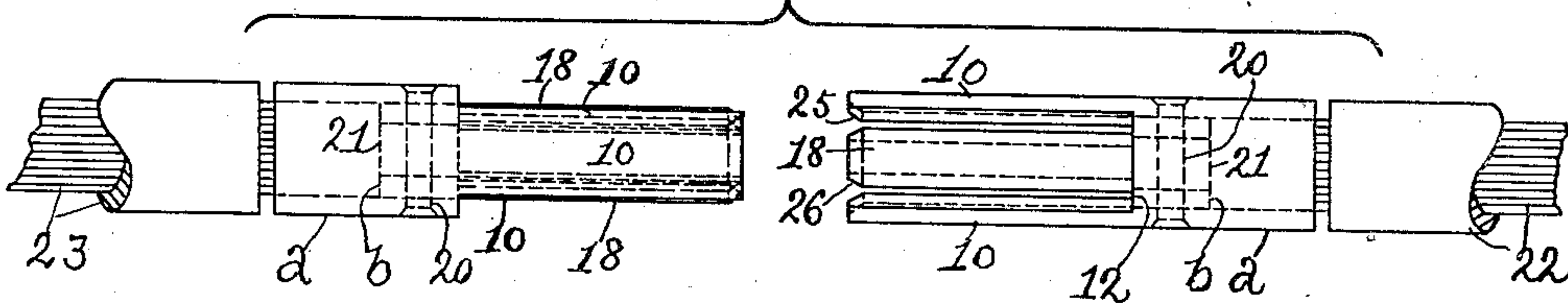
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2,125,816

CONTACT MEMBER FOR ELECTRICAL CONNECTIONS

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Fig-1.



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## UNITED STATES PATENT OFFICE

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## CONTACT MEMBER FOR ELECTRICAL CONNECTIONS

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This invention relates to an electrical contact member and has for its object to provide what may be considered a universal contact member in that the contact member functions as a male and female contact member.

The improved contact member is capable of being used for all kinds of electrical connections and is especially useful in electrical cables and particularly sections of cables, whereby time and labor may be saved, when one cable section is connected with another.

The universal contact member may be flat, square, round or of any desired shape in cross section, and is provided with two sets of contact fingers, each set having its fingers separated by a space of a width equal or substantially equal to the width of the fingers, and the fingers of each set are arranged to register with the spaces between the fingers of the other set, so that when two of the universal contact members are fitted together to complete the electrical connection, the fingers of each contact member will enter the spaces between the fingers of the other contact member.

It is preferred to make the universal contact members cylindrical in shape and when so made the two sets of fingers are located in different circles with the fingers in the smaller circle registering with the spaces in the larger circle as will be described. To facilitate engagement of one contact member with another and to obtain a most efficient contact, the fingers of the outer set are beveled inwardly at their free ends, and the fingers of the inner set are beveled outwardly at their free ends.

These and other features of the invention will be pointed out in the claims at the end of this specification.

Fig. 1 represents portions of two sections of a cable or conductor provided with universal contact members embodying this invention;

Fig. 2 is an elevation of the contact members shown in Fig. 1;

Fig. 3, a longitudinal section of the contact member shown in Fig. 2; the section being taken on the line 3—3, Fig. 6.

Fig. 4, an end view of the outer set of contact fingers shown separately;

Fig. 5, an end view of the inner set of contact fingers shown separately;

Fig. 6, a cross section of the contact members with the inner and outer sets of fingers in their operative position and with the fingers of one set registering with the spaces of the other set;

Fig. 7, a cross section showing the contact member square in cross section;

Fig. 8, a cross section of the contact member in flat form, and

Fig. 9, an elevation of the contact member shown in Fig. 8.

In the preferred form shown in Figs. 1 to 6, two circular tubes *a*, *b* of brass or other suitable metal are employed. The tubes *a*, *b* may be designated as the outer and inner tubes and are of diameters which will ensure a tight fit of the inner tube *b* within the outer tube *a*.

The outer tube *a* is provided with a plurality of contact fingers 10, which are herein shown as two in number and may be formed by cutting a pair of slots 12 which extend for a portion of the length of the tube *a* from one end thereof. The slots 12 are of a width equal to or substantially equal to the width of the fingers 10. The fingers 10 and their separating slots 12 constitute the outer set of contact fingers and spaces of the improved contact member.

The inner tube *b* has an outer diameter equal or substantially equal to the inner diameter of the outer tube *a*, so as to fit tightly within the latter.

The inner tube *b* is provided with a pair of slots 16, which extend from one end of the tube *b* toward its other end and form a pair of fingers 18. The fingers 18 are opposed to each other and register with the spaces 12 of the outer tube, and the spaces 16 register with the fingers 10 of the outer tube *a*. The spaces 16 are of a width equal to or substantially equal to the width of the fingers 18.

The tubes *a*, *b* may be secured together not only by a driving fit but also mechanically by means of a pin 20 which is preferably riveted at its ends, after the manner shown in Fig. 3.

The inner tube *b* may be closed at its inner end by a plug 21 through which the pin 20 is extended. The inner tube *b* is preferably made of less length than the outer tube *a* so as to leave the rear end of the outer tube *a* free to receive the end of a cable or conductor 22 which is soldered or otherwise secured therein.

By reference to Figs. 1 to 6 inclusive, it will be seen that when the tubes *a*, *b* are assembled and fastened together to form the improved contact member, the latter is provided with a plurality of sets of contact fingers, each set having a plurality of fingers separated by spaces of the same or substantially the same width as the fingers of its set.

When the tubes *a*, *b* are assembled and fas-



tened together after the manner represented in Figs. 1, 2 and 3, there is produced a contact member which may be used as a universal contact member, in that it is both a male member and a female member, and can be soldered or otherwise connected with the opposite ends of a section or length of conductor or cable, and enable either end of a cable section to be coupled with or connected to another cable section when it is desired to lengthen the electrical cable or conductor, thereby enabling cable sections to be connected in a minimum time and also avoiding loss of time on the part of the workman or operator, who is enabled to pick up either end of a cable section equipped with the universal contact member, and make the proper connection with another cable section.

Prior to this invention, cable sections have been provided with a male member at one end and with a female member at the other, and when cable sections have been connected, it has frequently occurred, that the operator making the connection has picked up one end of the cable section and carried it to where the connection was to be made, and then found that he had picked up the wrong end of the cable section, and therefore was obliged to reverse the ends of the cable section he had picked up in order to make the proper connection.

This procedure caused not only loss of time but also labor on the part of the operator, as the cable sections are frequently not only long but also heavy.

Furthermore, a workman in the shop would attach the wrong contact members to the opposite ends of the cable sections, that is, he would erroneously connect two male contact members to the ends of the cable section or two female members, which error might not be discovered until it was attempted to couple two cable sections together.

When such error was discovered, the cable section having like contact members at its opposite ends, would have to be changed with loss of time and labor.

With the universal contact member herein shown, such errors cannot occur, because only one type or construction of contact member would be required to be kept in stock, and that would be soldered or otherwise connected with both ends of all the cable sections. In this case, a workman providing the cable sections with contact members at both ends, could not make a mistake.

In Fig. 1, two sections 22, 23 of a conductor or cable are represented, which are provided with contact members illustrated in Figs. 2 and 3. These contact members are of like construction as above described, and when the connection is made, the contact member of the cable section 22, is positioned with relation to the contact member of the cable section 23 so that the contact fingers 10 of the outer set will be inserted into the spaces 12 of the outer set of the contact member attached to the cable section 23, and the fingers 18 of the inner set attached to the cable section 22 will be inserted into the spaces 16 of the inner set of the contact member attached to the cable section 23.

At the same time, the fingers 10, 18 of the contact member attached to the cable section 23, will be inserted into the spaces 12, 16 of the contact member attached to the cable section 22.

When the contact members are thus coupled or nested together, it will be seen that the outer

and inner fingers 10, 18 of one contact member will make contact with the inner and outer fingers 18, 10 of the other contact member.

It will further be seen that the spaces 12, 16 of one contact member serve as sockets for the fingers 10, 18 of the other contact member, and that the fingers 10 of the outer set which are inserted into the spaces 12 of the outer set make contact with the fingers 18 of the inner set which register with the spaces 12 of the outer set, and also that the fingers 18 of the inner set which are inserted into the spaces 16 of the inner set make contact with the fingers 10 of the outer set which register with the spaces 16 of the inner set.

To facilitate the entrance of the fingers of one contact member into the spaces of the other contact member, it is preferred to provide the free ends of the outer and inner fingers 10, 18 with oppositely inclined bevels, the outer fingers 10 having bevels 25 on their inner side and the inner fingers 18 having bevels 26 on their outer side (see Figs. 1 to 5 inclusive).

In Figs. 1 to 6, the contact member is shown as circular in form, but it may be made in other forms. In Fig. 7, the contact member is represented as square in cross section, whereas in Figs. 8 and 9, it is represented as substantially flat. The contact member when made flat as represented in Figs. 8 and 9, may be composed of two plates 28, 30, which are riveted or otherwise secured together and each provided with a plurality of contact fingers separated by spaces of the same or substantially the same width as the fingers, the fingers 31 on one plate as 28 being opposed to or registering with the spaces 32 of the other plate 30, and the fingers 33 of the plate 30 registering with the spaces 34 of the plate 28, thereby forming inner and outer sets of fingers and spaces similar to those shown in Figs. 1 to 7.

While the improved contact member has been described as used in connection with cable or conductor sections, it is not desired to limit the invention in this respect as the improved contact member may be universally used where an electrical connection is desired.

Electrical connections as heretofore made and known to me have required the use of a separate male member and a separate female member, whereas the contact member herein shown and described is both a male member and a female member.

What is claimed is:

1. An electrical contact member having an outer tube provided with contact fingers opposite each other and separated by spaces of a width substantially equal to that of said fingers, and having a second tube within the outer tube provided with contact fingers separated by spaces of a width substantially equal to that of the last-mentioned contact fingers, said second tube having its spaces registering with the contact fingers of the outer tube and its contact fingers registering with the spaces of the outer tube.

2. An electrical contact member having a tube provided with a set of contact members opposite each other and separated by spaces of a width substantially equal to that of said contact members and having a second set of contact members located within and supported by said tube and arranged to register with the spaces of said tube and separated by spaces which register with the first-mentioned contact members of said tube.



3. A contact member of an electrical connector having a plurality of sets of contact fingers lying in different planes, each of said sets having a plurality of contact fingers constituting a part of the same contact member and separated from each other by spaces, the contact fingers of each set registering with the spaces of the other set in a single contact member.

4. An electrical connector comprising like terminal members, each terminal member having a plurality of sets of contact fingers lying in different circles, each of said sets having a plurality of contact fingers separated from each other by spaces and constituting a part of said terminal member, the contact fingers of each

set registering with the spaces of the other set.

5. A universal contact member for an electrical connector comprising a contact member having a plurality of sets of contact fingers and spaces separating from each other the contact fingers in each set, the contact fingers of one set being disposed out of alignment with the contact fingers of another set, and the contact fingers in each set constituting a part of the same contact member and being arranged so that they register with the spaces between the contact fingers of the other set of the same contact member.

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