

Jan. 6, 1953

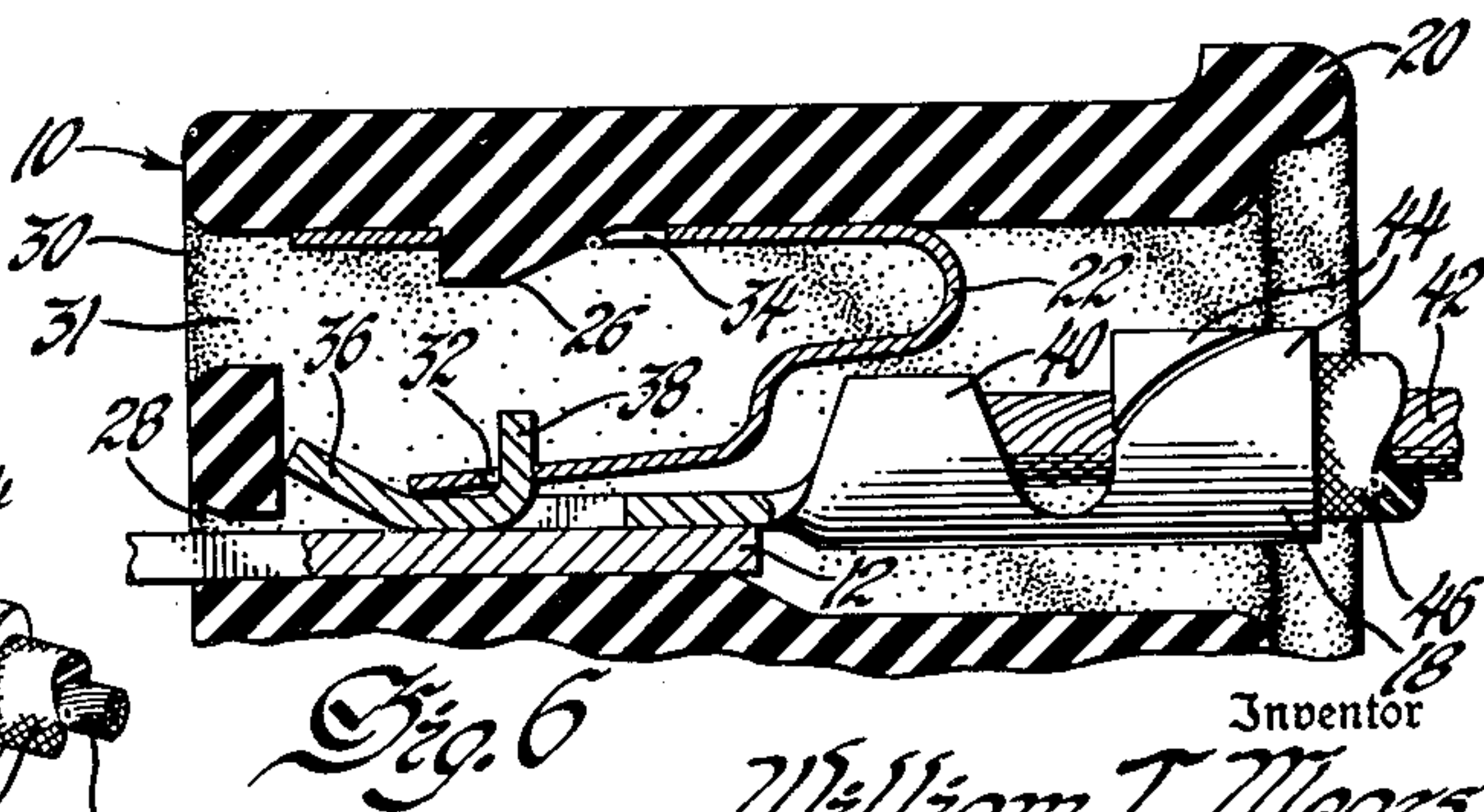
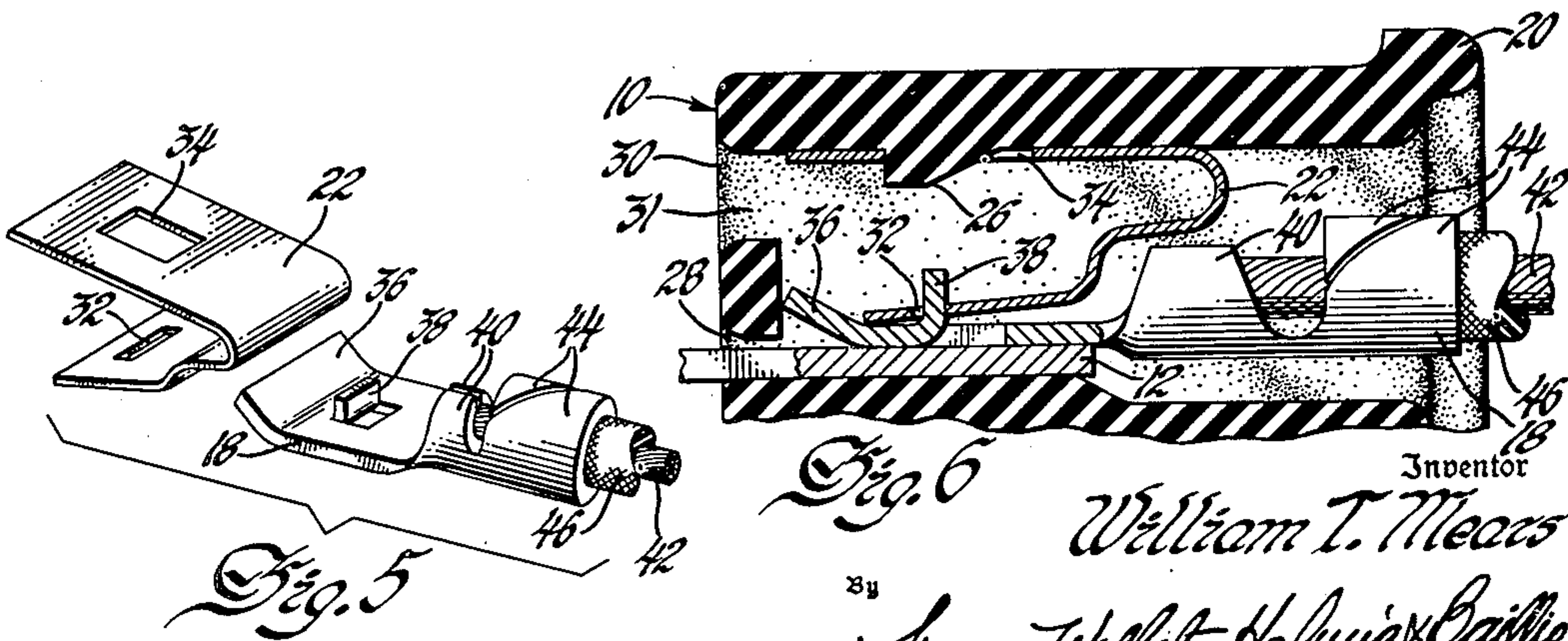
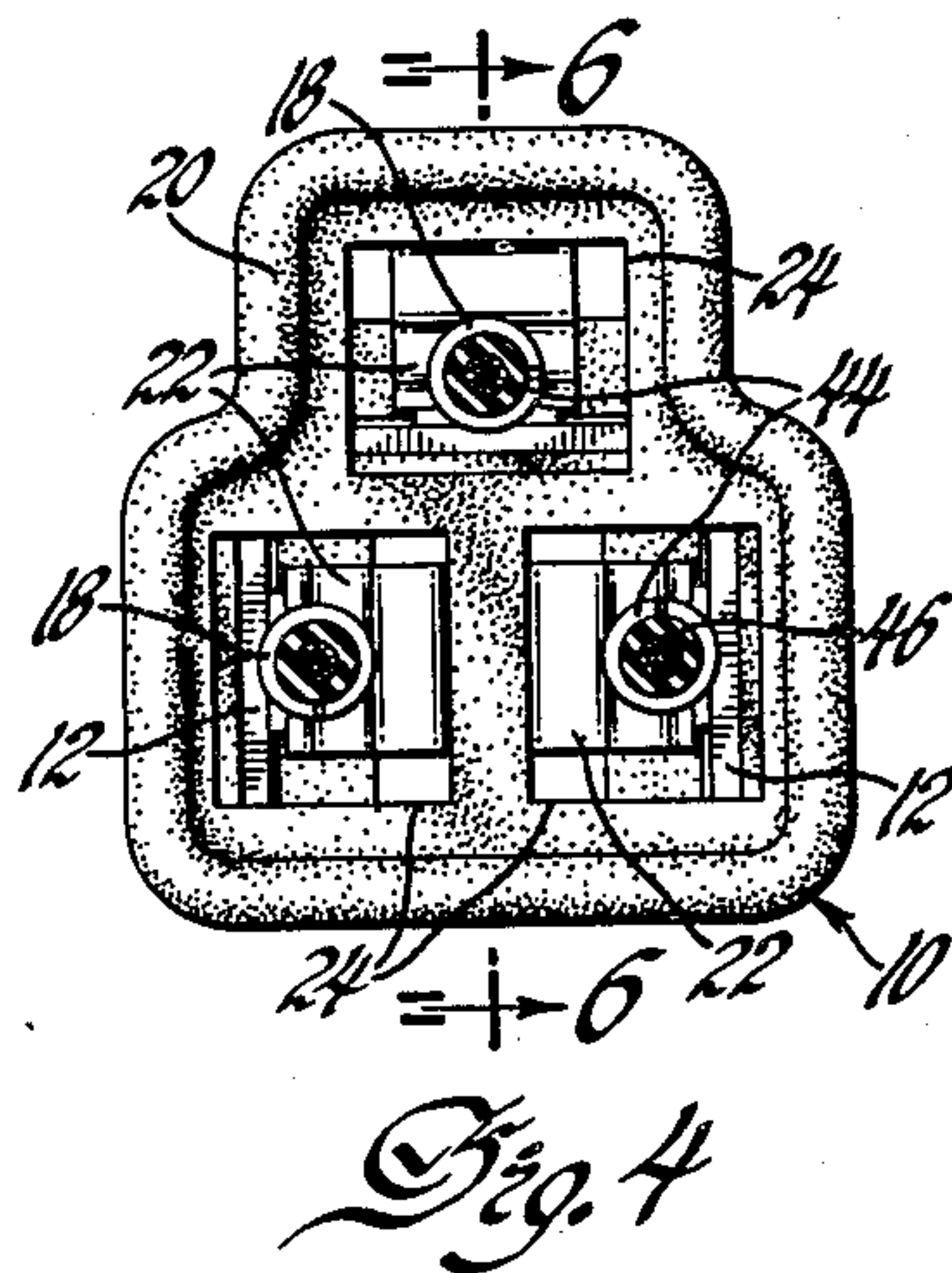
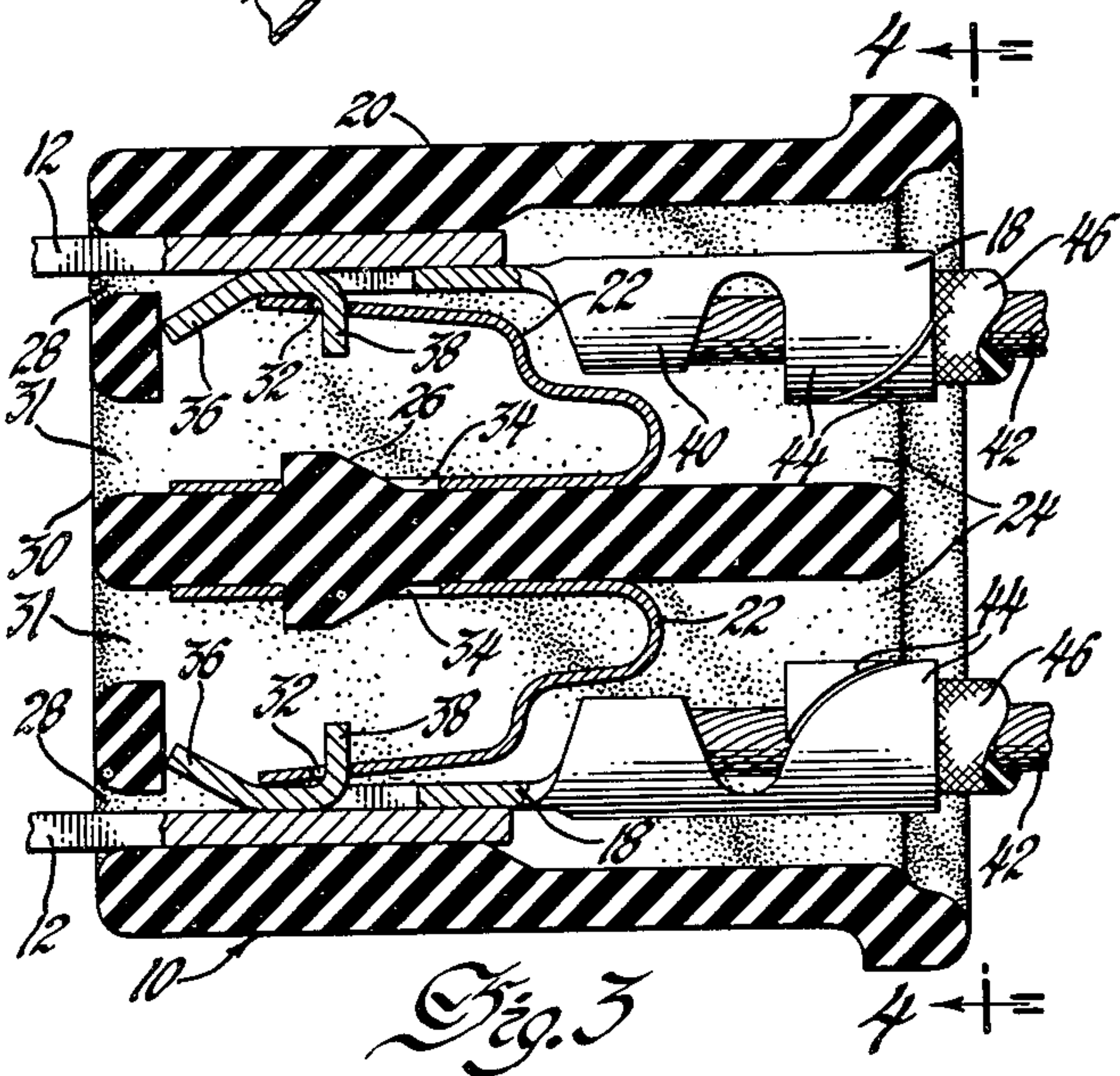
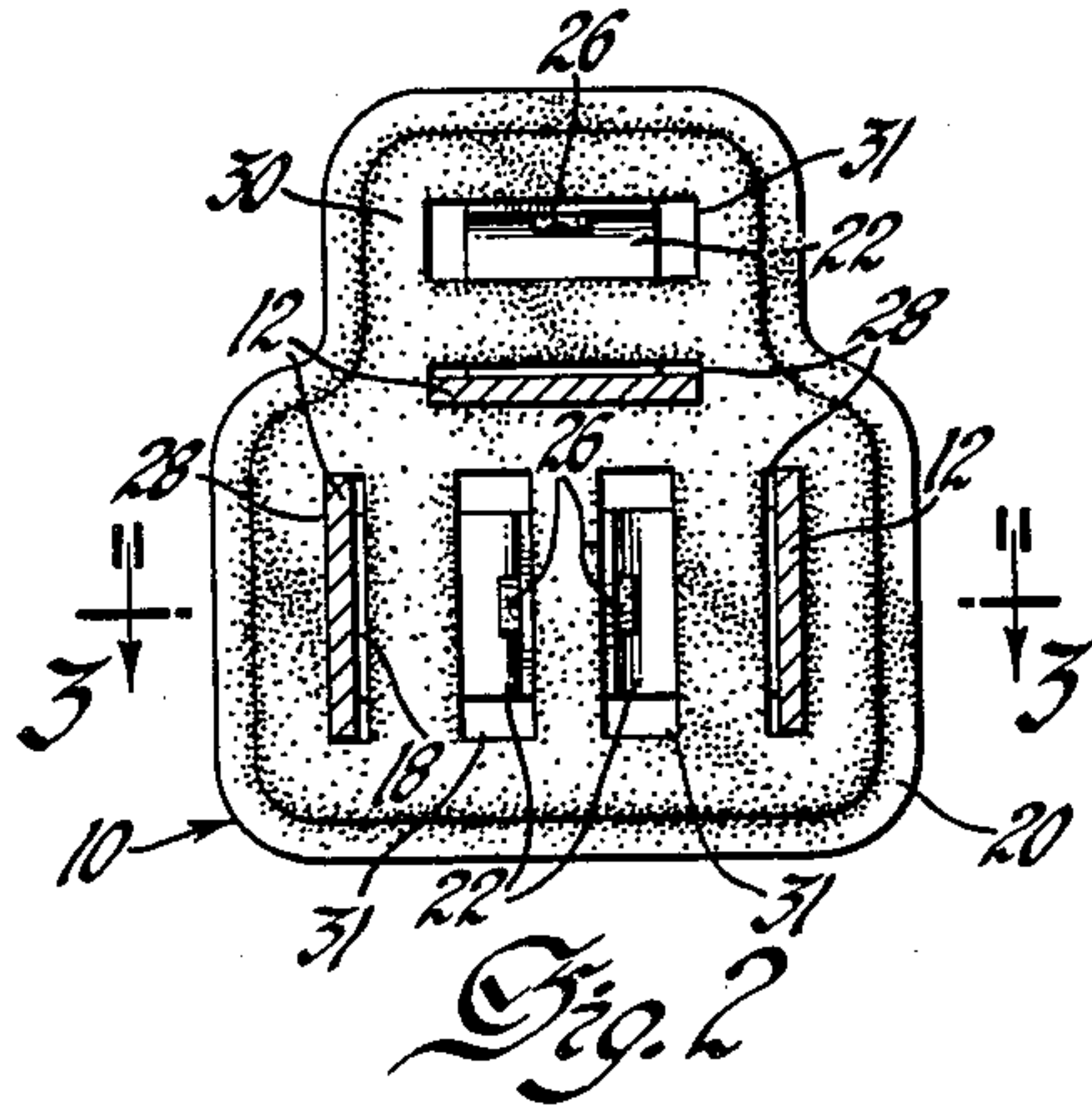
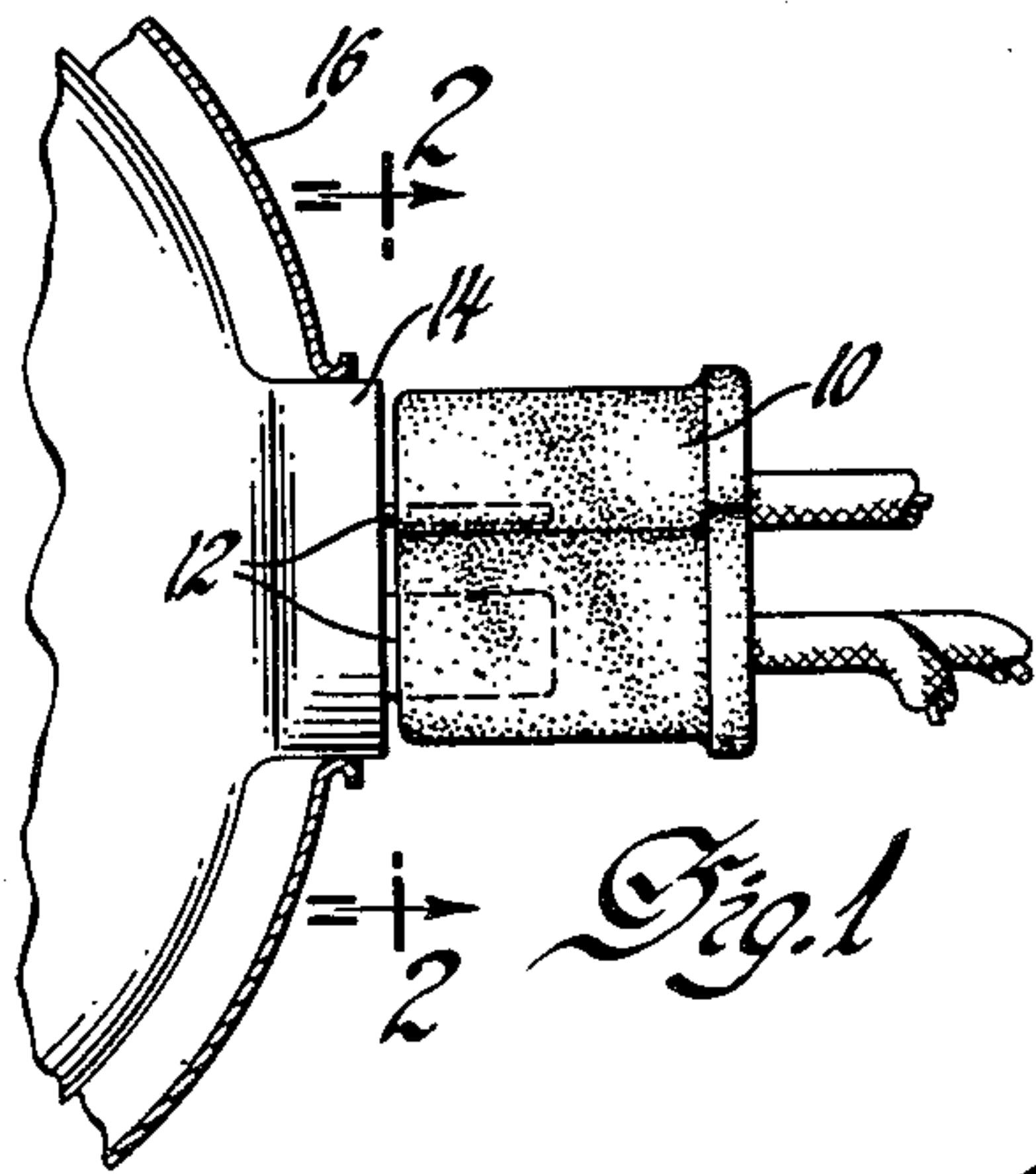
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2,624,773

SOCKET CONNECTOR HAVING REMOVABLE TERMINALS

Filed June 9, 1948

2 SHEETS--SHEET 1



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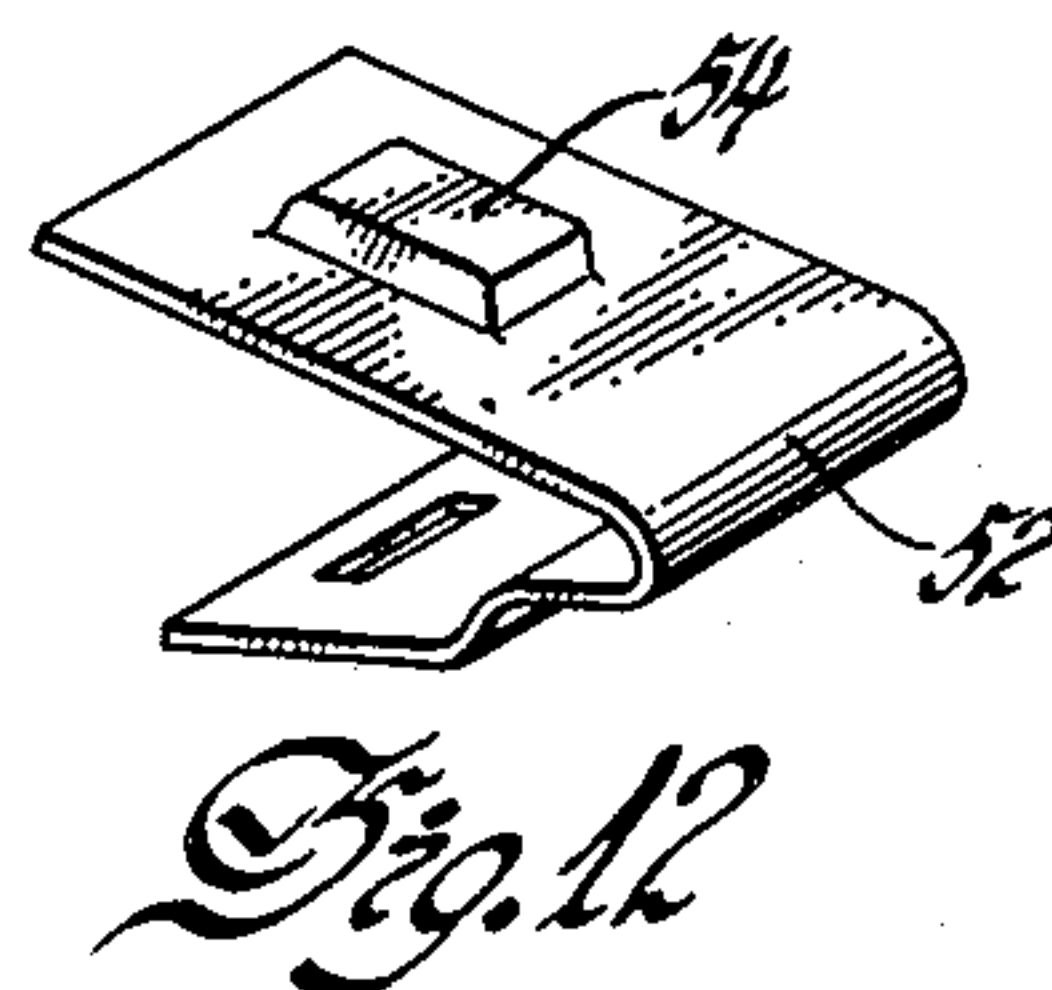
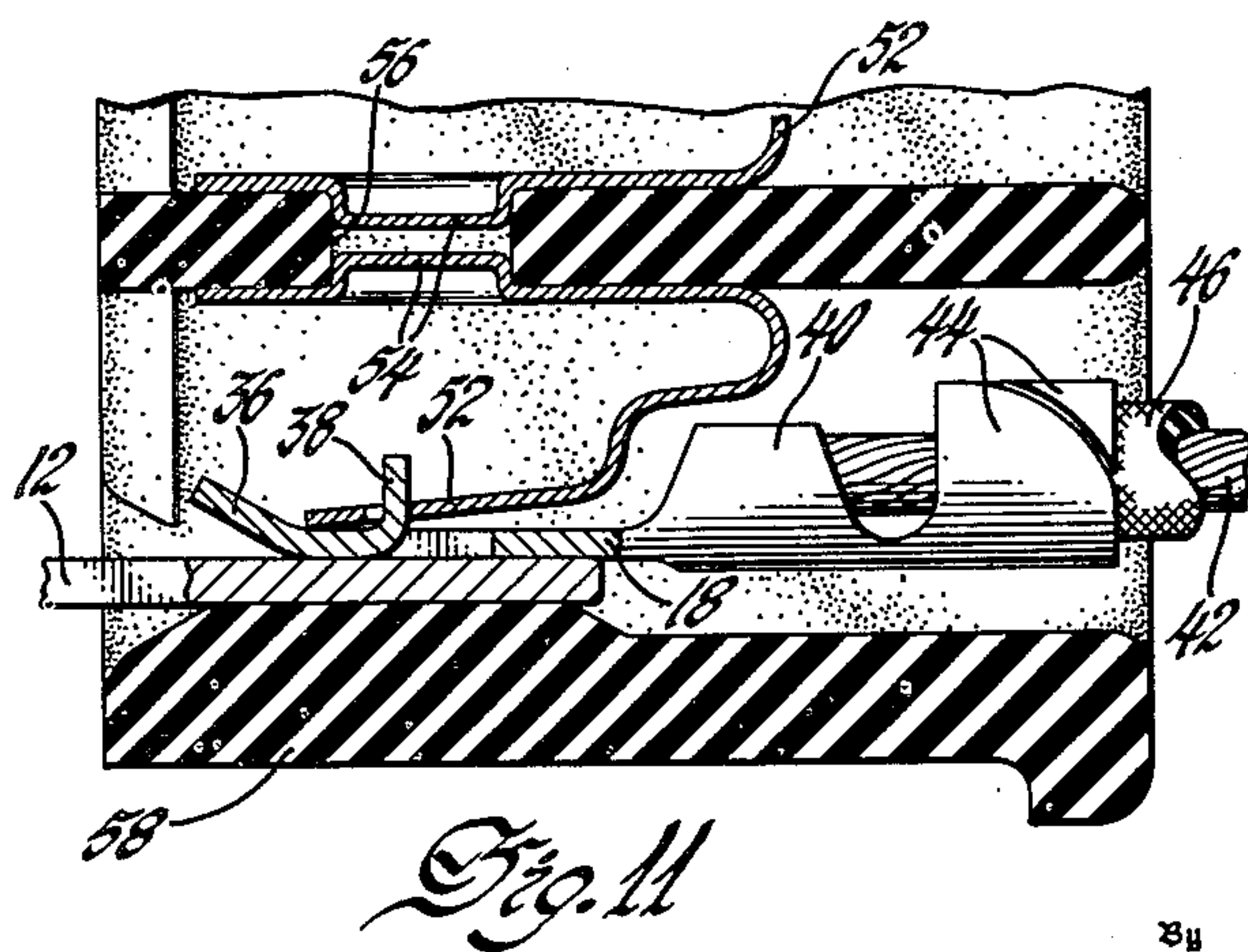
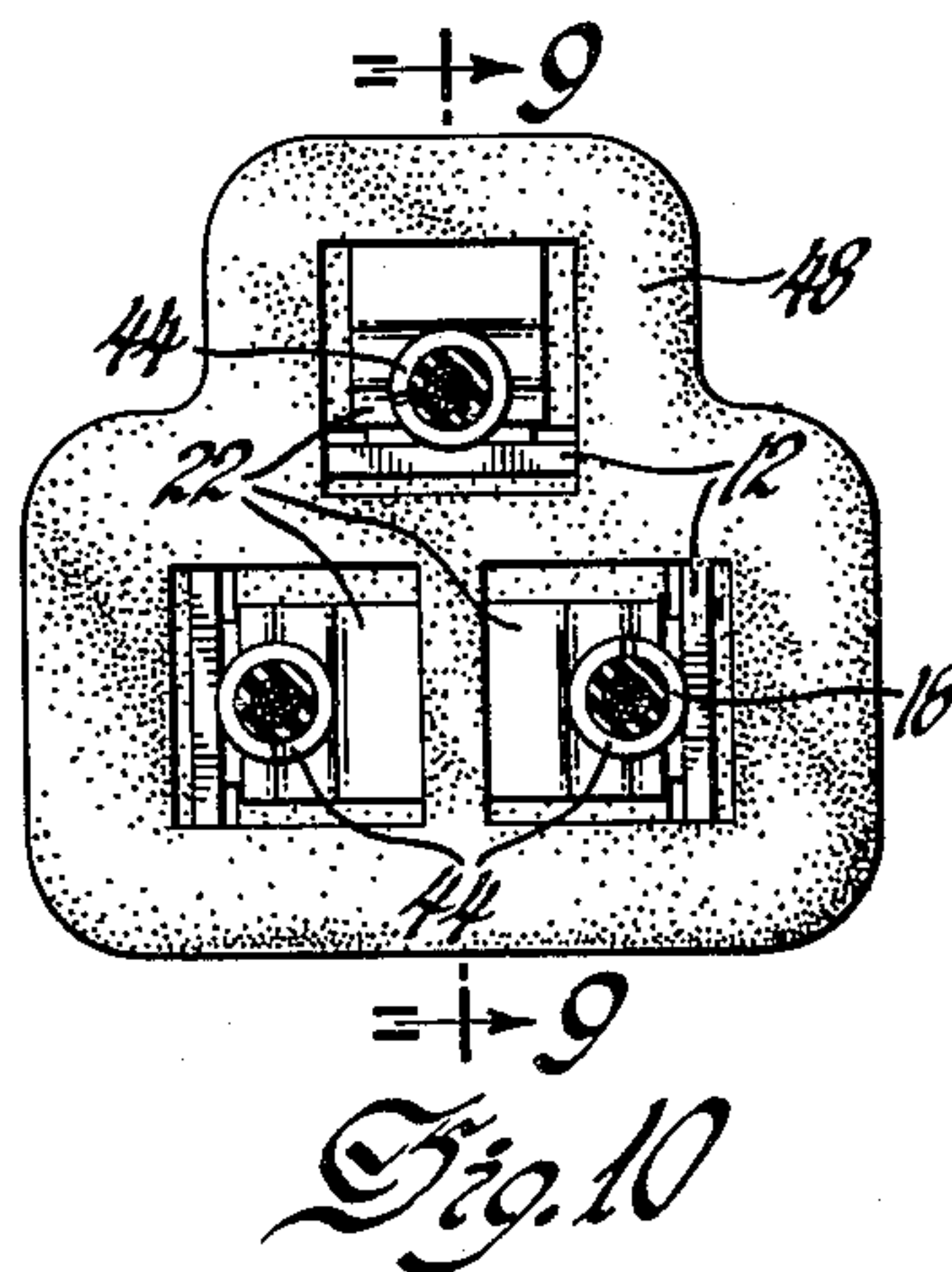
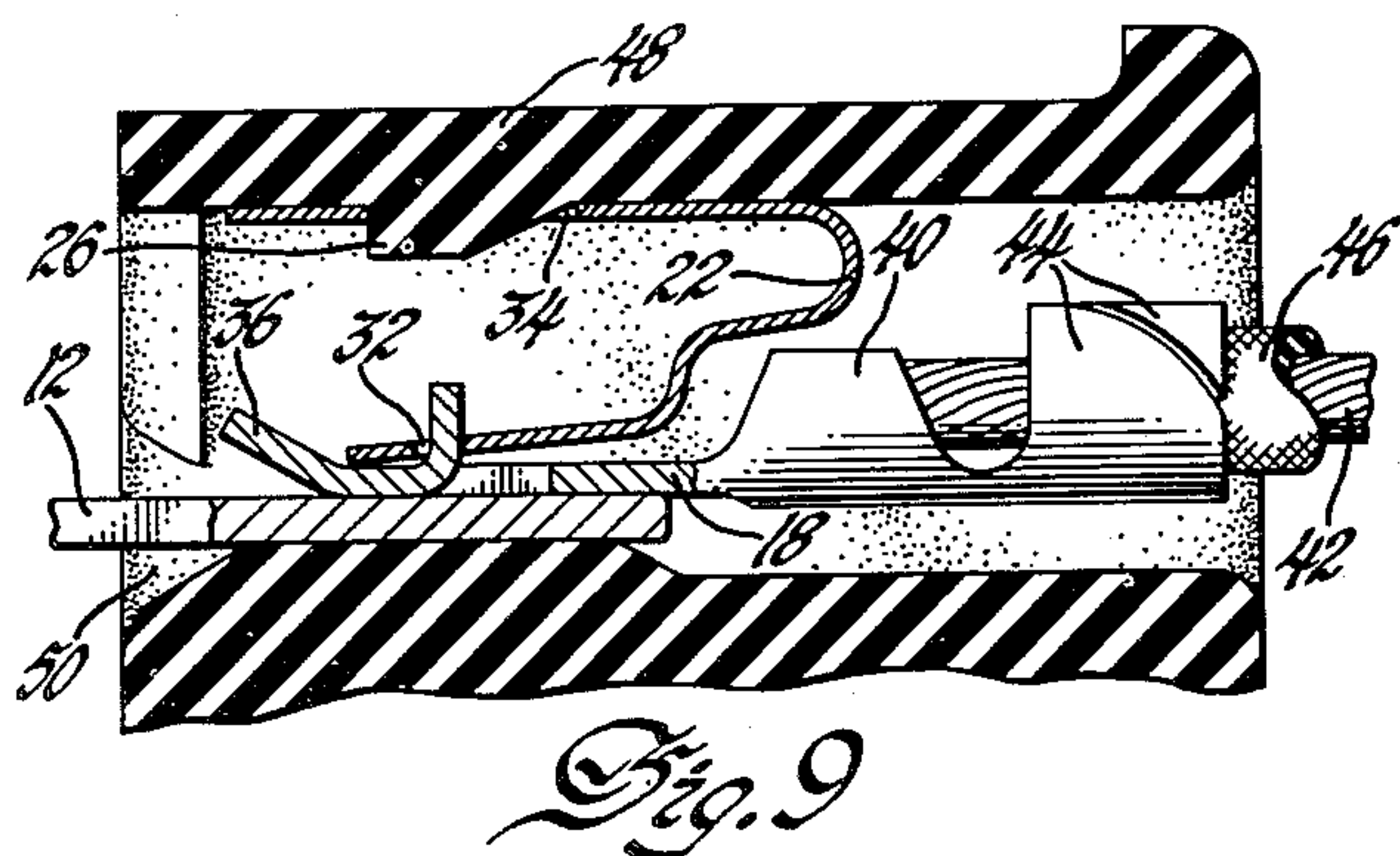
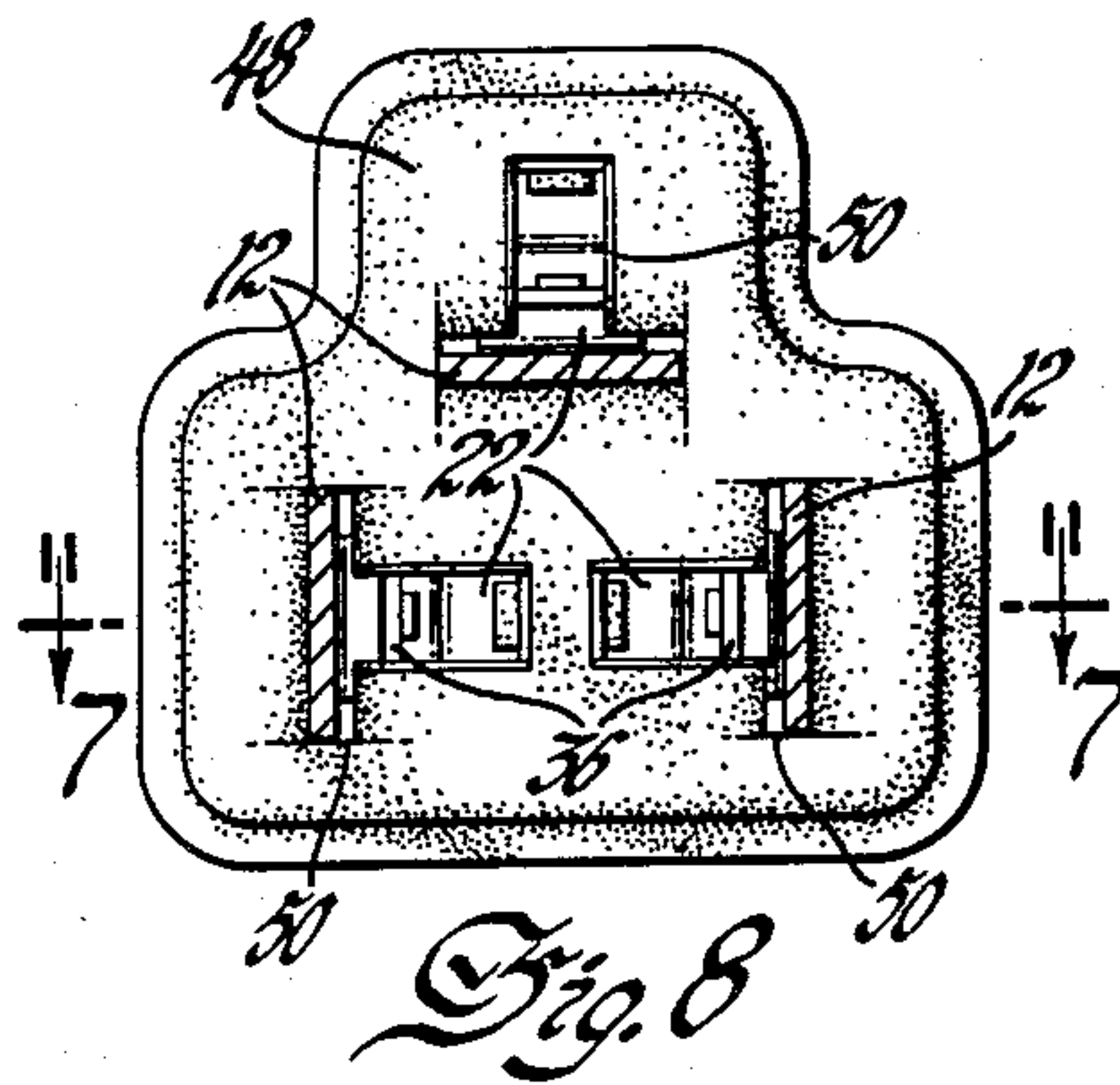
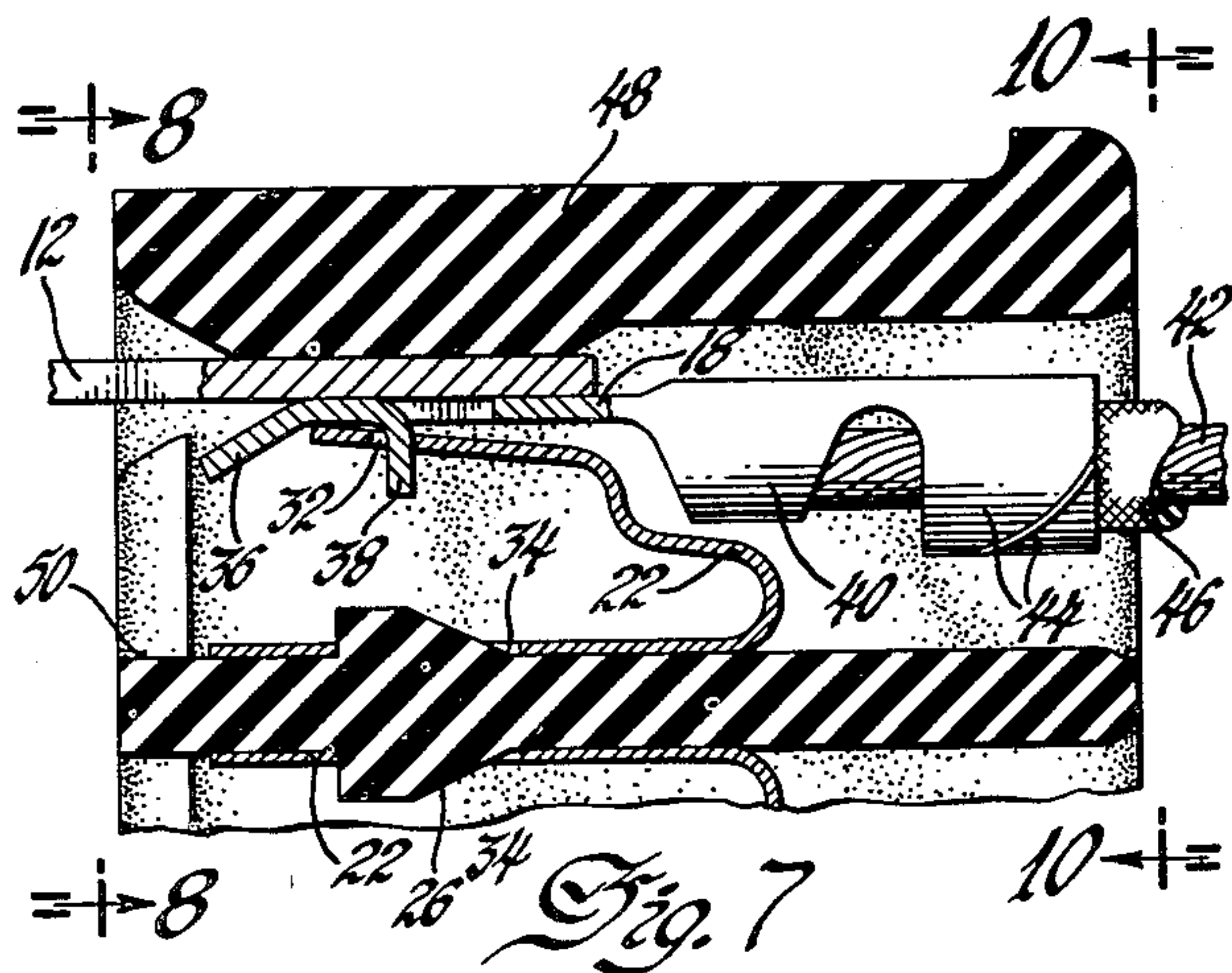
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SOCKET CONNECTOR HAVING REMOVABLE TERMINALS

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2 SHEETS—SHEET 2



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UNITED STATES PATENT OFFICE

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SOCKET CONNECTOR HAVING REMOVABLE
TERMINALS

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6 Claims. (Cl. 173—328)

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The present invention relates to electrical connecting devices and more particularly to connectors associated with the terminals of lamps such as are used in automobile headlamps or light projecting units of the type commonly known as "Sealed Beam" headlamps for detachably connecting one or more lamp terminals with one or more wires of an electrical current conducting cable.

It is the principal object of the present invention to provide a device of the above-mentioned character which may be quickly and easily attached to or detached from the terminals of a lamp without disturbing the assembled relationship of the connector parts.

It is a further object of the present invention to provide a connector construction which is simple, inexpensive, easily assembled and adapted to quantity production manufacturing methods.

These and other objects are attained in accordance with the present invention by providing a connector in which the connector terminal is positioned in a recess formed within the body of the connector and held in position for positive engagement with the terminal of a lamp by an electrically independent, generally U-shaped member formed with means adjacent its ends which interlock respectively with cooperating members on the connector terminal and in the wall of the body recesses. Being electrically independent, i. e., not forming part of the current conducting path, the generally U-shaped member may be made of a resilient material, such as steel, which is less apt to take a permanent set during the assembly of the terminal in the connector recess; thus insuring that the connector terminal will be securely locked in contact-engaging position and that there will be better circuit engaging relationship between the connector and lamp terminals.

Further objects and advantages of the present invention will become apparent as the following description proceeds and the features of novelty which characterize this invention will be pointed out with particularity in the claims annexed to and forming a part of this specification.

For a better understanding of my invention reference may be had to the accompanying drawings in which:

Figure 1 is a side elevation showing the connector applied to the terminals of a headlamp bulb; Figure 2 is a view of the connector taken along the line 2—2 of Figure 1; Figure 3 is a sectional view taken along the line 3—3 of Figure 2; Figure 4 is a view of the connector taken along

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the line 4—4 of Figure 3; Figure 5 is an exploded perspective view of the connector terminal and one form of the generally U-shaped member; Figure 6 is a fragmentary view in section taken along the line 6—6 of Figure 4; Figure 7 is a fragmentary view in section similar to Figure 3 taken along the line 7—7 of Figure 8 illustrating a modified form of connector housing; Figure 8 is a view taken along the line 8—8 of Figure 7; Figure 9 is a fragmentary view in section taken along the line 9—9 of Figure 10; Figure 10 is a view taken along the line 10—10 of Figure 7; Figure 11 is a fragmentary view in section illustrating another form of the connector housing and Figure 12 is a perspective view of a modified form of the generally U-shaped member.

Referring now to Figure 1, there is shown the connector 10 of the present invention forming part of a lighting unit assembly. The connector 10 is applied to the terminals 12 of a lamp 14 mounted in a reflector 16. The lamp 14, reflector 16 and the cooperating lens (not shown) may form part of what is commonly known as a "Sealed Beam" lighting unit. The terminals 12, as shown, are formed in the shape of flat blades or prongs and are adapted to register directly with the connector terminals 13 in a manner best shown in Figures 3 and 6.

The connector 10 comprises an insulative body member 20, connector terminals 13 and resilient members 22. The body member 20 is made of a suitable insulative material and formed with a plurality of passages 24 adapted to receive and position the lamp terminals 12 and the connector terminals 13 in current conducting relationship. Shoulders 26 formed in one wall of passages 24 are provided for locking the connector parts in position as will be described hereinafter. Rectangular openings 28 corresponding to the position of the lamp terminals 12 are provided in the end wall 30 of the connector 20 for receiving the lamp terminals 12. Rectangular openings 31 are formed in the end wall to permit the insertion of a sharp-edged instrument for lifting the leg of the U-shaped member engaging the shoulder 26 clear of the shoulder when it is desired that the connector be disassembled.

The resilient member 22 is made of a material preferably steel which has suitable spring characteristics to prevent its taking a permanent set during the assembling of the connector. It is formed in a generally U-shape and provided with rectangular openings 32 and 34 adjacent its end portions. Where the resilient member 22 is made of steel or a material susceptible to corrosion, it

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is generally preferred that the member be coated with a suitable corrosion resisting material as, for example, cadmium.

The connector terminals 18 are made of a suitable current conducting material and formed into the shape shown in Figures 3, 5 and 6 from a stamping by a series of continuous manufacturing operations. It comprises a turned end portion 36, a lug 38, a pair of cooperating ear members 40 which engage the conducting wire 42 and a pair of cooperating angular ear members 44 which are clinched about the conductor wire coating 46. To provide suitable electrical conducting relationship between the conducting wire 42 and the connector terminal 18 after the conductor wire 42 has been clinched in the position shown, the portion comprising the ear members 40 and the end of the conducting wire 42 is dip-soldered.

In assembling the connector 10 the resilient member 22 is secured to the connector terminal 18 by inserting the lug 38 of the connector terminal 18 in the rectangular opening 32 of the resilient member 22 and the secured parts are inserted into the recess 24 in the connector body 20 until the shoulder 26 formed in the wall of recess 24 engages and interlocks with the rectangular opening 34 in the resilient member 22. It will be seen from Figures 3 and 6 of the drawings that when the shoulder 26 and rectangular opening 34 interlock the turned end 36 of the connector terminal 18 abuts the end wall of the connector body 20 and is in position to receive the lamp terminal 12 along the face of its turned end.

In Figures 7, 8, 9 and 10 of the drawings there is illustrated a modification of the connector of the present invention in which the body member 48 is provided with T-shaped openings 50 in the end wall. With this form of opening the leg of the T-shaped opening provides means for inserting an instrument to disassemble the connector while the top of the T-shaped opening is in position to receive the lamp terminals 12.

In Figures 11 and 12 of the drawings there is illustrated another modification of the connector in which the generally U-shaped member 52 is provided with a lug 54 adjacent one end of the member which cooperates with an aperture 56 in the connector body member 58 to secure the assembled connector terminal in the body member.

A connector such as I have described hereinabove in connection with the present invention is composed of a minimum of parts and materials and may be easily and quickly assembled thereby insuring a low cost of manufacture. Moreover, the arrangement of parts whereby the resilient member locks the connector terminal in the connector enclosure is not apt to be disassembled by the thrust of the lamp terminals when the connector is applied to the lamp.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. An electrical connector comprising a body of electrically insulating material having a passage therethrough, a stop formed on said body adjacent one end and extending into said passage, a shoulder formed on said body and extending inwardly therefrom into said passage, a terminal member positioned in said passage, said terminal member having a flat contact engaging portion in normal engagement with the wall of said passage, said flat contact engaging portion having an end portion angularly inclined thereto and extending into engagement with said stop, a lug

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formed intermediate said flat portion and extending transversely thereto into said passage, a plurality of longitudinally spaced conductor clinching ears provided at the other end of the flat contact engaging portion and a generally U-shaped resilient member positioned in said passage to yieldingly urge said flat portion into engagement with the wall of said passage and permit insertion of an electrical terminal between said terminal member and the wall of said passage, said resilient member having an aperture adjacent one end thereof in receiving engagement with said shoulder to lock said resilient member in said passage and an aperture adjacent its other end and in receiving engagement with said lug to lock said terminal member in said passage.

2. An electrical connector comprising a body of electrically insulating material having a plurality of passages therethrough, stops formed on said body adjacent one end and extending into each of said passages, a shoulder formed on said body and extending inwardly therefrom into each of said passages, a terminal member positioned in each of said passages, each terminal member having a flat contact engaging portion in normal engagement with the wall of the passage, each of said flat contact engaging portions having an end portion angularly inclined thereto and extending into engagement with one of said stops, a lug formed intermediate each of said flat portions and extending transversely thereto into the surrounding passage, a plurality of longitudinally spaced conductor clinching ears provided at the other end of the flat contact engaging portions of each of said terminal members and a generally U-shaped resilient member positioned in each of said passages to yieldingly urge the flat portions of each of said terminal members into engagement with the wall of the passage and permit reception of a terminal in each of the passages of said body between the terminal member and the wall of the passage, said resilient member having an aperture adjacent one end thereof engaging the shoulder in each of said passages and an aperture adjacent its other end and engaging the lug extending from the flat portions.

3. An electrical connector comprising a body of electrically insulating material having a passage therethrough, a shoulder formed on said body and extending inwardly therefrom into said passage, a terminal member positioned in said passage, said terminal member having a flat contact engaging portion in normal engagement with the wall of said passage, said flat contact engaging portion having an end terminal-guiding angularly inclined thereto, a lug formed near one end of said flat portion and extending transversely thereto into said passage, conductor attaching means provided at the other end of the flat contact engaging portion, and a generally U-shaped resilient member positioned in said passage to yieldingly urge said flat portion into engagement with the wall of said passage and permit insertion of an electrical terminal between said terminal member and the wall of said passage, said resilient member having an aperture adjacent one end thereof in receiving engagement with said shoulder to lock said resilient member in said passage and an aperture adjacent its other end and in receiving engagement with said lug to lock said terminal member in said passage.

4. An electrical connector comprising a body of electrically insulating material having a passage therethrough, stop means formed on said body adjacent one end and extending into said

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passage, a shoulder formed on said body and extending inwardly therefrom into said passage, a terminal member positioned in said passage, said terminal member having a flat contact engaging portion in normal engagement with the wall of said passage, said flat contact engaging portion having an end portion angularly inclined thereto and extending toward said stop means, a lug formed intermediate said flat portion and extending transversely thereto into said passage, means on the end of said terminal contact portion opposite said inclined end for securing an electrical conductor, and a generally U-shaped resilient member positioned in said passage to yieldingly urge said flat portion into engagement with the wall of said passage and permit insertion of an electrical terminal between said terminal member and the wall of said passage, said resilient member having an aperture adjacent one end thereof in receiving engagement with said shoulder to lock said resilient member in said passage and an aperture adjacent its other end and in receiving engagement with said lug to lock said terminal member in said passage.

5. An electrical connector comprising a body of electrically insulating material having a plurality of passages therethrough, electrical terminal stop means formed on said body adjacent one end and extending into each of said passages, a shoulder formed on said body and extending inwardly therefrom into each of said passages, a terminal member positioned in each of said passages, each terminal member having a flat contact engaging portion in normal engagement with the wall of the passage, each of said flat contact engaging portions having an end portion angularly inclined thereto and extending toward one of said stop means, a lug formed intermediate each of said flat portions and extending transversely thereto into the surrounding passage, means on the end of each of said contact portions opposite said inclined end for securing an electrical conductor, and a generally U-shaped resilient member positioned in each of said passages to yieldingly urge the flat portions of each of said terminal members into engagement with the wall of the passage and permit reception of a terminal in each of the

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passages of said body between the terminal member and the wall of the passage, said resilient member having an aperture adjacent one end thereof engaging the shoulder in each of said passages and an aperture adjacent its other end and engaging the lug extending from the flat portions.

6. An electrical connector comprising a body of electrically insulating material having a passage therethrough, a locking portion forming a part of said body, a terminal member positioned in said passage, said terminal member having a flat contact engaging portion in normal engagement with the wall of said passage, said flat contact engaging portion having an end terminal-guiding portion angularly inclined thereto, a lug formed near one end of said flat portion and extending transversely thereto into said passage, conductor attaching means provided at the other end of the flat contact engaging portion, and a generally U-shaped resilient member positioned in said passage to yieldingly urge said flat portion into engagement with the wall of said passage and permit insertion of an electrical terminal between said terminal member and the wall of said passage, said resilient member having a locking portion adjacent one end thereof for cooperative engagement with said first named locking portion to lock said resilient member in said passage and an aperture adjacent its other end and in receiving engagement with said lug to lock said terminal member in said passage.

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