

Oct. 4, 1949.

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2,483,944

SWIVEL ROPE SOCKET

Filed March 6, 1946

2 Sheets-Sheet 1

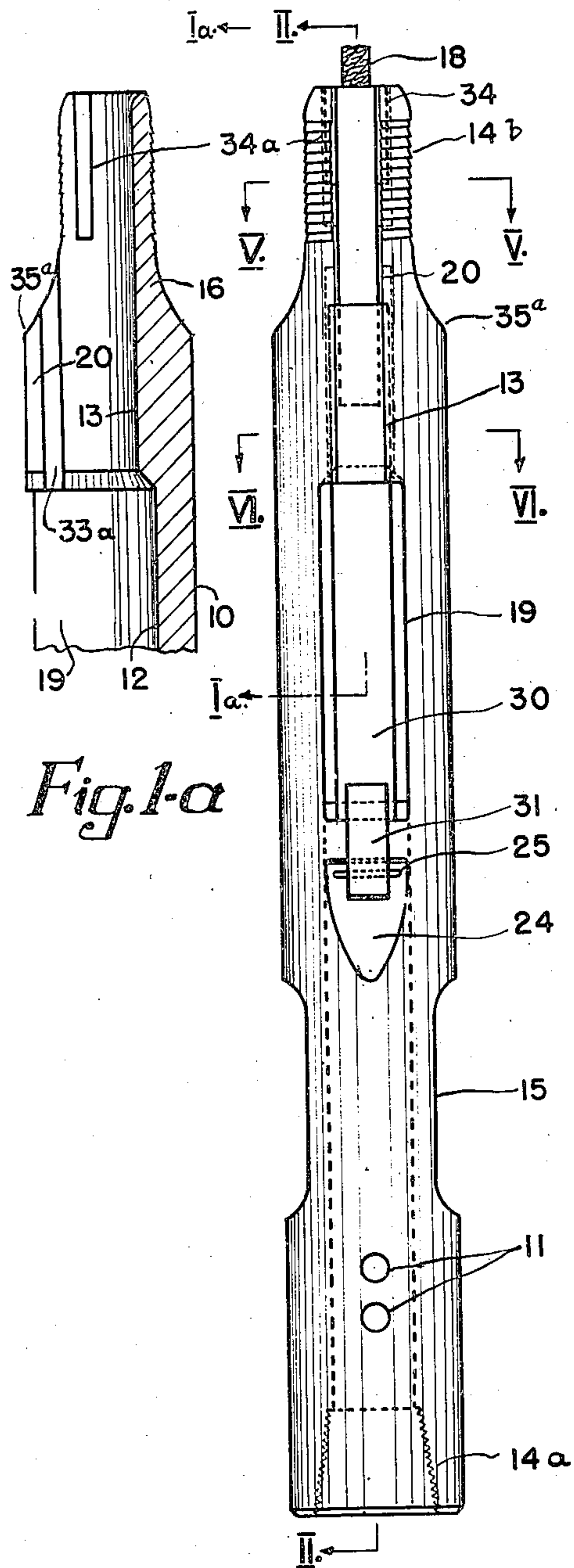


Fig. 1-a

Fig. 1

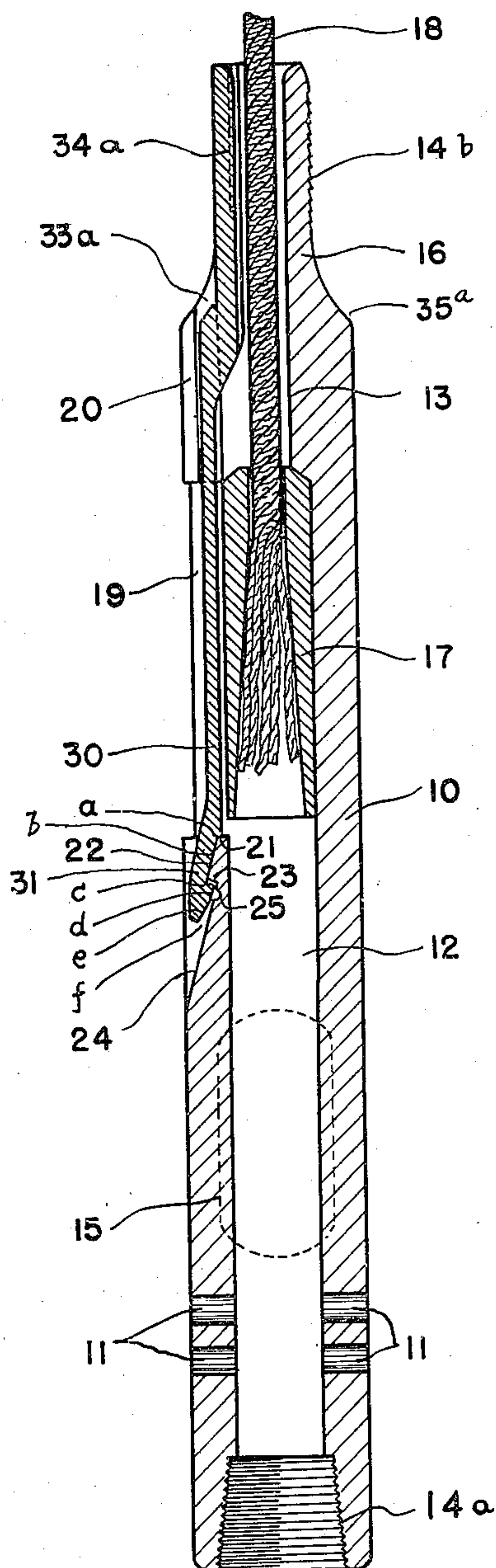


Fig. 2

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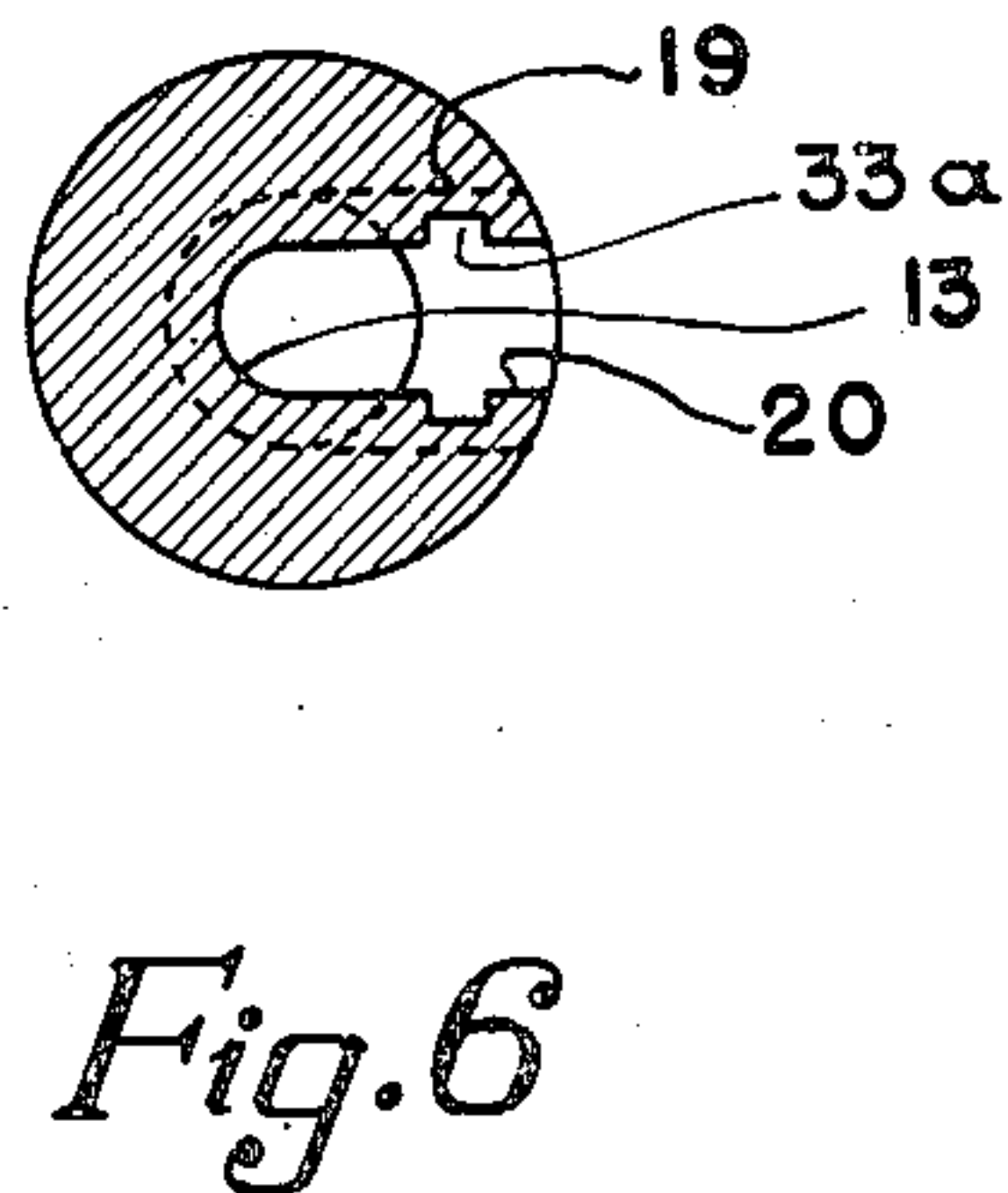
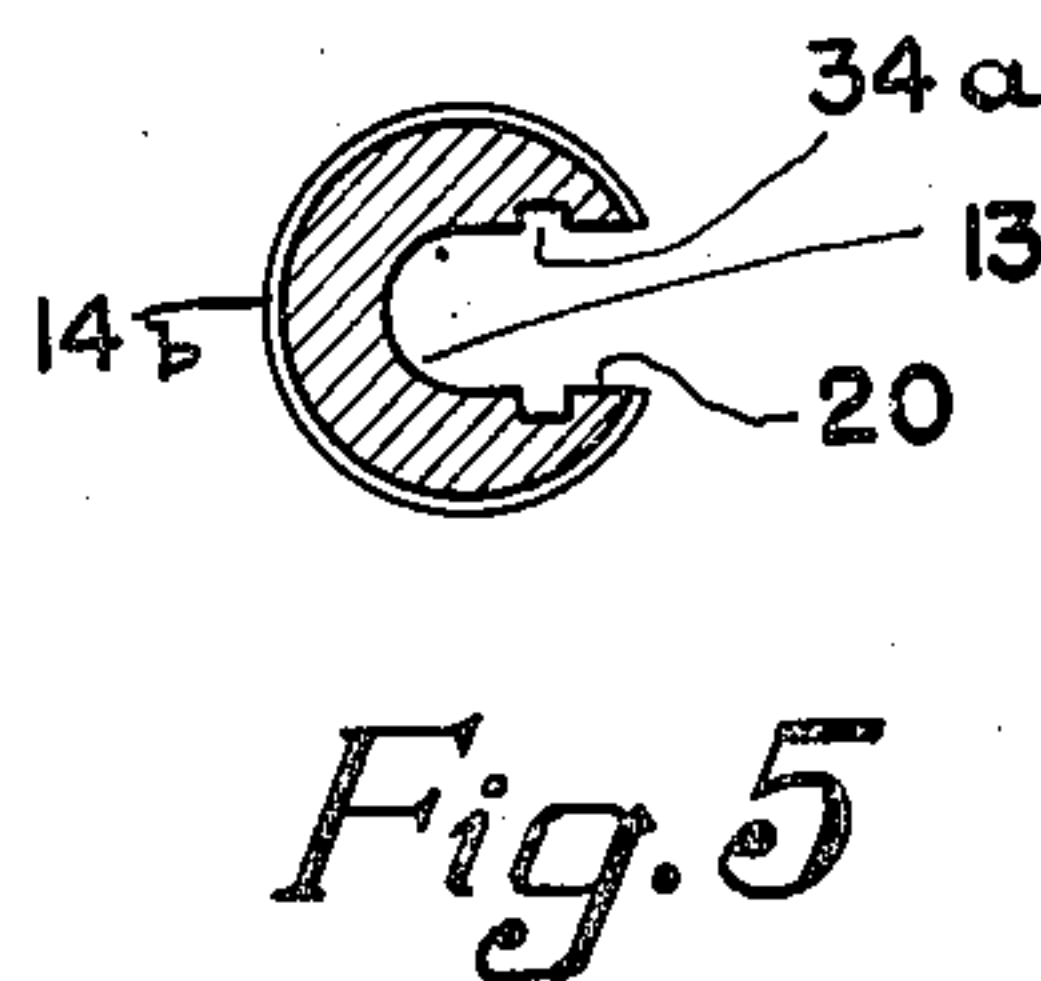
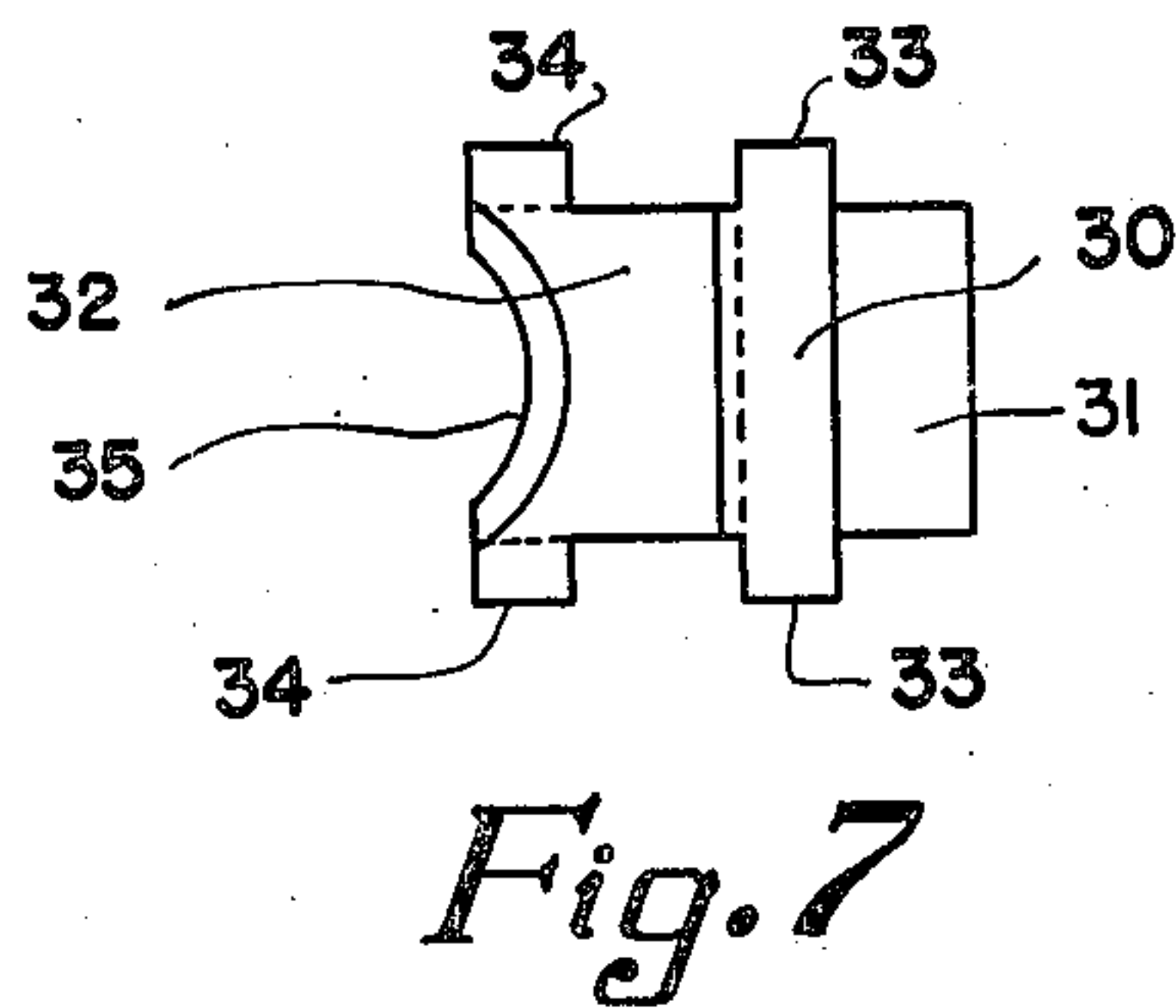
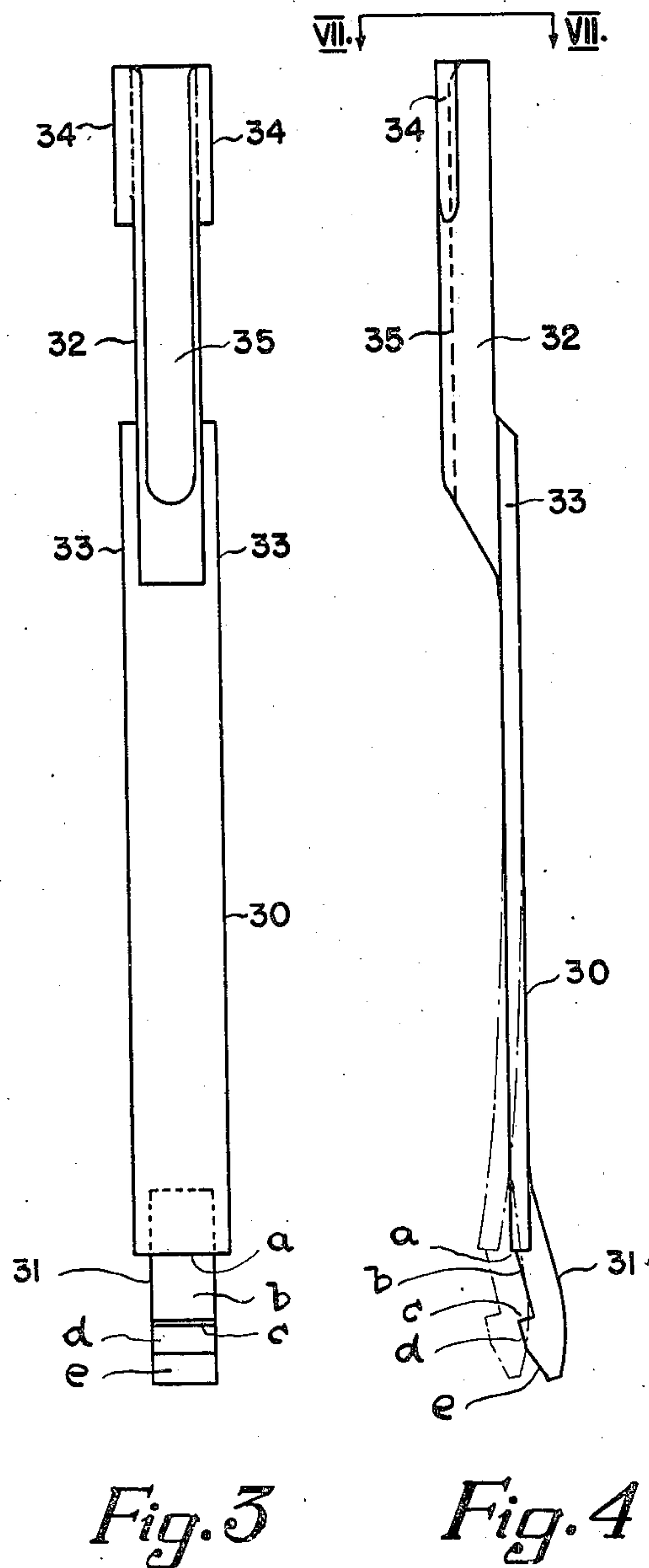
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SWIVEL ROPE SOCKET

Ferdinand J. Spang, Butler, Pa.

Application March 6, 1946; Serial No. 652,256

1 Claim. (Cl. 24—123)

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This invention pertains to rope socket or connecting apparatus for wells, and more particularly, to rope socket devices for detachably connecting operating cables to a string of tools used in oil, gas, artesian, or other types of wells.

Previous to the present invention rope socket devices, particularly of a detachable type, have been rather complicated in structural arrangement, resulting in loss of time and effort in effecting disengagement of the cable from the drill string, as well as in failure of the apparatus during use. The constructions have also been somewhat expensive from a production standpoint.

And it has been an object of my invention to provide an improved form of rope socket device for cable well drilling, and particularly, an improved form of detachable socket device.

Another object of the invention has been to provide an improved form of device by which a cable assembly can be removed from one string of tools and attached to a second string without removing the cable from its assembly.

A further object has been to provide a detachable socket apparatus which will positively hold the cable attached to a drill string and at the same time permit its removal when desired with a minimum of effort and by a simple operation.

A still further object has been to provide a rope socket device, the fishing neck of which is fully supported circumferentially against collapse when engaged by a grappling device.

Another object of this invention is to provide a simple, easily manipulated, foolproof, and easily produced rope or cable socket device.

These and many other objects of my invention will appear to those skilled in the art from the descriptive embodiment shown, as well as from the specification and claim.

In the drawings, Figure 1 is a front view in elevation of a tool length or device illustrating an embodiment of my invention. Figure 1a is a fragmental section taken along the line Ia—Ia of Figure 1 with the locking member removed.

Figure 2 is a vertical section taken along the line II—II of Figure 1.

Figure 3 is a vertical view in elevation of a locking member shown in the embodiment of Figures 1 and 2 taken from an inner side or face of the member.

Figure 4 is a vertical view in elevation of the member of Figure 3, but taken at right angles to Figure 3.

Figure 5 is a lateral section of the socket device taken along the line V—V of Figure 1.

Figure 6 is a similar sectional view taken along the line VI—VI of Figure 1.

Figure 7 is an enlarged top or lateral view of a locking member taken along the line VII—VII of Figure 4.

Referring particularly to Figures 1 and 2, I have shown a barrel body or housing member 10 of somewhat cylindrical shape provided with an enlarged bore 12 that extends upwardly from its lower end to connect with a smaller bore 13 at its cable receiving end. The lower end of the body portion 10 is provided with an outwardly inclined female screw thread portion 14a to attach it to a suitable tool or drill string. The device has a wrench flat portion 15 for turning the threads 14a into a connected position with the tool string and may have suitable sand, mud or fluid by pass slots 11. The barrel or body 10 is provided with an inwardly offset or lesser diameter extending portion 16 (of smaller diameter than its main body part) at its cable-receiving end, preferably somewhat cylindrical in shape, having male threads 14b that may be engaged by a tool or grapple, if the cable or rope becomes parted.

A socket or swivel 17, preferably of cylindrical shape, is provided with a bore that converges outwardly adjacent its lower end for receiving the end of a rope or cable 18. The cable 18 may be permanently secured to swivel 17 in any suitable manner known to the art, such as by babbitting. Thus, the swivel 17 forms a socket for the drill cable and its outer walls cooperate with inner walls of the larger bore 12 in such manner as to permit limited vertical reciprocation within the body 10 as well as relative rotative movement therebetween.

A lateral slot or opening 19 extends lengthwise or vertically along wall portions on one side (front side of Figure 1) of the body member 10 and has a size and location such that it will permit the swivel 17 to pass laterally through it into the bore 12. A more narrow lateral slot 20 extends from the cable-receiving end of the body member 10 along the extension 16 into the smaller bore 13 to connect with the slot 19. The swivel body 17 when socketed on the cable 18 may be freely inserted into the bore or body of the member 10 or removed therefrom by passing the cable and swivel laterally through and lengthwise along the slots 19 and 20. This permits the cable to be changed from one tool string to another or to any implement operated by a cable and having a suitable socket body.

In Figures 3 and 4 I have shown a locking

member length 30 that may be employed to hold the cable assembly in position and close off the slots 19 and 20, after the swivel 17 and its associated cable have been inserted therethrough. The locking member 30 is preferably of a metal having suitable flexibility and tensile strength to provide a spring action, see the dot and dash lines of Figure 4. The member 30 has an extending latch portion or element 31 adjacent one end and an upwardly extending guide or slide-way portion 32 adjacent the other end, see also Figure 7. The guide element or member portion 32 is provided with projecting flange or keyway portions 34 that are adapted to cooperatively engage slotted keyway or lengthwise extending guide portions 34a within the body or bore of member portion 16. The keyways 34a extend lengthwise from the top of and along the smaller bore 13 of the body portion 16. The inner face 35 of the guideway portion 32 is preferably beveled or curved out to correspond to a section of a circular surface such as the cable 18. Outer edge portions 33 of the member 30 are also adapted to act as key portions and to enter keyway slots or guides 33a extending lengthwise or downwardly from a front face of ledge portion 35a along bore 13.

The locking member 30 is mounted in slots 19 and 20 by inserting its key portions 34 into slotted keyways 34a at the end of the body portion 16 and its key portions 33 into the slotted keyways 33a at the ledge 35a and sliding the member 30 downwardly into and along the laterally open slots 19 and 20 to at least substantially close them off and force the latch portion 31 over the latch face 22.

The latch portion 31 is thus flexed outwardly as shown in Figure 4 and snaps into a latching position shown in Figure 2. This locks the member 30 in such a way as to securely hold it in position within or over the slots 19 and 20. The latch portion 31 of the member 30 is provided, see particularly Figure 4, with step-like or laterally offset portions a and c connected by a vertical face portion b which are adapted to be tension-forced into a clamping relationship over and into abutment with extending ledge portions 21 and 23 and inclined and connecting face portion 22 of the body 10. That is, when the latching device 30 has been slid down to its lower position, the portion 31 which extends beyond the slots will be forced over the extending portions 21, 22 and 23 of the body member 10 to positively lock it in position thereover. Portion 31 of the latch 30 is deflected in a spring-like manner outwardly as the member 30 is forced downwardly. Thus, tension of the member 30 aids in forcing the portion 31 against and over engaging portions of the body member 10. The locking member 30 can be quickly removed by inserting a pry bar into opening f between an inclined face e of the latch portion 31 and an inclined face 24 of the body 10 in such a way as to engage a bight 25 cut in the face 24. Thus, the pry bar can be forced against the portion 31 to spring it outwardly and permit it to be raised lengthwise out of the keyways 33a and 34a and then laterally out of the slots 19 and 20.

It will be noted that a longitudinal flange of the portion 32 of the locking member completely closes the slot 20 when the member is in its mounted position in such a manner that compression force such as exerted by a grapple engaging the inwardly offset extending portion 16, cannot collapse it in an inward direction.

It will be apparent that one of the pair of spaced guideway latch portions 33 and 33a or 34 and 34a can be eliminated if desired.

The device can be made, if desired, in a forge shop by utilizing a drop hammer.

In utilizing the invention, one or more tool strings may be fitted with body members such as 10 which in turn may be connected to bail or sand pumps or other well tool apparatus by threaded portions 14a. A cable assembly such as 17 and 18 may then be inserted and removed as desired from a body member such as 10. In mounting the locking member 30, sufficient pressure is applied to its upper end to force its latch portion 31 downwardly over the ledge 22 until it engages and springs over the projecting step portions 21 and 23. The tool string is then in an operating condition and may be lowered into the well bore to perform its intended work. After the work of a particular tool has been accomplished and another tool or device is to be employed, the string is raised out of the drill hole and the locking member 30 removed as above indicated to permit the substitution of another tool without removing the previous tool from the body 10. That is, a number of tools may be attached to a number of body portion members 10, ready for quick use as needed. By utilizing the device shown, a cable 17 and 18 may be quickly and easily mounted in body portions 10 of a tool string as desired.

Although for purposes of illustration, I have shown a particular embodiment of my invention, it will be apparent that other embodiments and that various modifications, additions and substitutions may be effected on the embodiment shown without departing from the spirit and scope of the invention as indicated by the appended claim.

What I claim is as follows:

A rope socket device for wells which comprises, a barrel member having a cable-receiving upper part and a cable-socket-receiving main body part terminating in a lower part for attaching it to a tool or well string, said cable-receiving part having a threaded male-upper-end of smaller diameter than the remainder of said cable-receiving part which latter is of substantially the same diameter as said main body part and is connected to said main body part, said cable-receiving part having a bore extending longitudinally therealong from its upper end and extending laterally through a side wall portion of said cable-receiving part, said main body part having a longitudinally extending bore entrant to and of larger diameter than the bore of said cable-receiving part, an upper portion of the larger bore of said main body part extending laterally through the side wall of said main body part and from the corresponding lateral extension of the bore of said cable-receiving part and having a length at least equivalent to the length of a cable-socket to be introduced and removed there-through, said main body part having a pair of stepped-ledge portions sloped outwardly from a lower end of the lateral extension of the larger bore of said main body part, a longitudinal guideway entrant from the upper end of and extending along the wall of said cable-receiving upper part which is adjacent to the lateral extension of the bore thereof, a second longitudinal guideway entrant from an upper face of a shoulder formed between the smaller diameter upper end and the remainder of said cable-receiving

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part and extending along the wall of the remainder of said cable-receiving part which is adjacent to the lateral extension of the bore of said part; a locking member having a length greater than the combined lengths of the said 5 bore extensions of said body member, said locking member having an inwardly offset upper part of a length and width substantially corresponding to the length and width of the lateral extension of the bore of said cable-receiving 10 part, said offset upper part of said locking member having guideway portions constructed and arranged to cooperatively engage and slide along the said first-mentioned longitudinal guideway of said cable-receiving upper part and to enter said 15 guideway from the upper end of said part, said locking member having a lower part connected to its inwardly offset upper part and being outwardly offset with respect to said upper part thereof, said lower part of said locking member having 20 guideway portions constructed and arranged to cooperatively engage and slide along said second-mentioned longitudinal guideway of said barrel

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member and to enter said guideway from the above-mentioned shoulder, said lower part of said locking member being of flexible construction and having an outwardly-inclined extending-end provided with a pair of latch portions that are constructed and arranged to securely engage said pair of stepped-ledge portions of said main body part for locking said latching member in position with respect to said barrel member.

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