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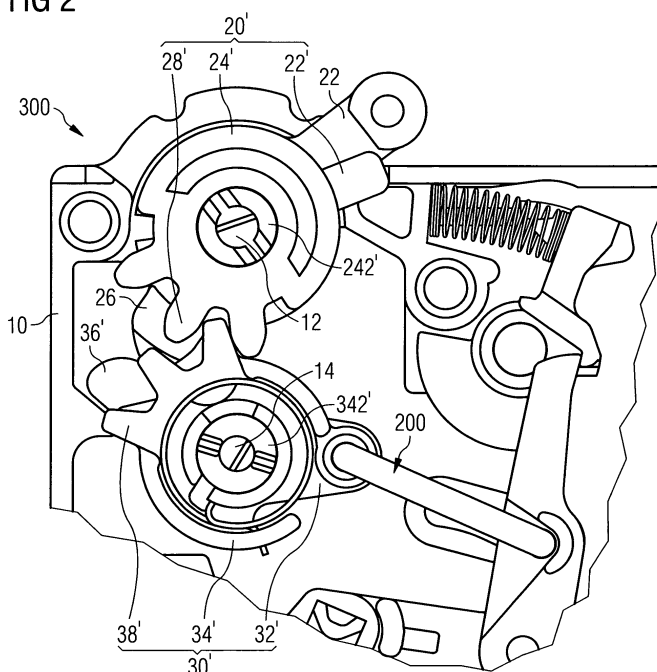
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(54) **Dual-operation handle device**

(57) The present invention provides a dual-operation handle device comprising a base with rotating shafts, and a main operation handle and a coupler mounted on one of said rotating shafts wherein said main operation handle and coupler are provided with mated projecting edges so that when said main operation handle is operated to turn around the rotating shaft, said coupler will be driven by said mated projecting edge to turn around the rotating shaft. Said dual-operation handle further comprises an ancillary operation handle which is arranged concentri-

cally with said main operation handle and is provided with at least one tooth. Said coupler is further provided with at least one tooth to engage with the tooth of said ancillary operation handle so that when said ancillary operation handle is operated to turn around the rotating shaft, said coupler will be driven by said engaging teeth to turn around the rotating shaft. Said linkage mechanism connected with the coupler can be driven by only operating the ancillary operation handle, without operating said main operation handle or affecting the current state of said main operation handle.

FIG 2



Description

Technical Field

[0001] The present invention relates to an electric accessory of a low-voltage switch, and more particularly to an operation handle device of a low-voltage switch.

Background Technology

[0002] The low-voltage switch (e.g. alarm switch) is often provided with an operation handle device for driving a linkage mechanism to open or close a switch contact.

[0003] Figure 1 is a schematic diagram showing the structure of a typical prior operation handle device 100. Said operation handle device 100 comprises a base 10, an operation handle 20 mounted on said base 10, and a coupler 30 which is mounted on said base 10, connected with a linkage mechanism 200 and driven by said operation handle 20.

[0004] Said base 10 is provided with a rotating shaft 12 and another rotating shaft 14. Said operation handle 20 comprises a handle 22, a body 24 and a projecting edge 26 which are connected serially, wherein said handle 22 is used to receive operation from an external force, and said body 24 has a hole 242 and receives the rotating shaft 12 of said base 10 through the hole 242, and said projecting edge 26 is arranged on the external surface of said body 24. Preferably, the body 24 of said operation handle 20 is a cylinder, and said projecting edge 26 is arranged on the external circumference of said body 24. Said coupler 30 comprises a connecting part 32, a body 34 and a projecting edge 36 which are connected serially, wherein said connecting part 32 is connected with said linkage mechanism 200, and said body 34 has a hole 342 and receives the rotating shaft 14 of said base 10 through said hole 342. Said projecting edge 36 is arranged on the external surface of said body 34 and mates with the projecting edge 26 of said operation handle 20. Preferably, the body 34 of said coupler 30 is a cylinder, and said projecting edge 36 is arranged on the external circumference of said body 34.

[0005] When the handle 22 of said operation handle 20 is operated, said handle 22 will drive said body 24 to turn around the rotating shaft 12 of said base 10 and drive said projecting edge 26 to turn as well. The projecting edge 26 of said operation handle 20 is pressed against the projecting edge 36 of said coupler 30, thereby driving the projecting edge 36 of said coupler 30. Said projecting edge 36 is driven to rotate the body 34 of said coupler 30 around the rotating shaft 14 of said base 10 and to rotate said connecting part 32. As said connecting part 32 is connected with said linkage mechanism 200, the rotation of said connecting part 32 causes said linkage mechanism 200 to move so as to open or close the switch contact.

[0006] However, in the above-mentioned prior operation handle device 100, driving said linkage mechanism

200 to open or close the switch contact can only be made by operating said operation handle 20, in other words, a change in the state of the switch contact requires a change in the state of said operation handle 20. However, there are occasions in actual operation where it is desirable to drive said linkage mechanism 200 to open or close the switch contact when the state of the operation handle 20 is not changed or when said operation handle 20 is not suitable for operation. In these occasions, the prior operation handle device 100 cannot meet such operation requirement.

Description of the Invention

[0007] The present invention provides a duel-operation handle device, which provides an ancillary operation handle to drive the mechanism connected with said duel-operation handle device for required operation when the state of the operation handle is not changed, or the main operation handle is not suitable for operation.

[0008] In order to achieve the above objective, the present invention provides a duel-operation handle device comprising a base with two rotating shafts, a main operation handle and a coupler, wherein said main operation handle and coupler are arranged on one of the rotating shafts and are both provided with projecting edges that mate with each so that when said main operation handle is operated to turn around the rotating shaft, the coupler is driven by said mated projecting edge to turn around the rotating shaft. Said duel-operation handle device further comprises an ancillary operation handle which is arranged concentrically with said main operation handle and is provided with at least one tooth. Said coupler is further provided with at least one tooth to engage with the tooth of said ancillary operation handle so that when said ancillary operation handle is operated to turn around the rotating shaft, the coupler is driven by said the engaging teeth to turn around the rotating shaft.

[0009] Said ancillary operation handle comprises a handle, a body and said tooth which are connected serially, wherein said handle is used to receive operation, and said body has a hole and receives the rotating shaft of said base through the hole, and said tooth is arranged on the external surface of said body. Preferably, the body of said ancillary operation handle is a cylinder, and said tooth is arranged on the external circumference of said body. Preferably, said ancillary operation handle comprises a plurality of teeth which are equally spaced and distributed on the external surface of said body.

[0010] Said coupler comprises a body, and the projecting edge and tooth which are connected with said body, wherein said body has a hole and receives the rotating shaft of said base through said hole, and said projecting edge and tooth are arranged on the upper and lower external surface of said body respectively. Said coupler further comprises a connecting part which is connected with said body and external mechanism respectively.

[0011] Preferably, the body of said coupler is a cylinder, and said projecting edge and tooth are arranged on the external circumference of said body. Preferably, said coupler comprises a plurality of teeth which are equally spaced and distributed on the external surface of said body.

[0012] The duel-operation handle device of the present invention is preferably applied in a low-voltage switch, particularly an alarm switch. The duel-operation handle device of the present invention is operated to drive the mechanism connected therewith to move so as to open or close a switch contact. Particularly, as said main operation handle and ancillary operation handle can turn round the rotating shaft independent of each other, if the state of the main operation handle is not changed or the main operation handle is not suitable for operation, the ancillary operation handle can be operated to drive said linkage mechanism connected with said coupler without operating said main operation handle or affecting the current state of said main operation handle.

Description of the Drawings

[0013]

Figure 1 is a schematic diagram showing the structure of a typical prior operation handle device;

Figure 2 is a schematic diagram showing the structure of the duel-operation handle device of the present invention comprising a main operation handle for driving the coupler independently and an ancillary operation handle;

Figure 3 is a schematic diagram showing the structure without installation of the ancillary operation handle shown in figure 2; and

Figure 4 is a schematic diagram showing the structure of an embodiment in which the duel-operation handle device of the present invention is applied in a low-pressure switch.

Embodiments

[0014] The duel-operation handle device of the present invention is intended to provide a main operation handle and an ancillary operation handle, both of which can independently drive the coupler, thereby driving the mechanism connected with the coupler for required operation. In other words, said ancillary operation handle can be operated to drive the mechanism connected with the coupler when the state of the main operation handle is not changed, or when the main operation handle is not suitable for operation.

[0015] Referring to figure 2 and figure 3, the duel-operation handle device 300 of the present invention comprises a base 10, a main operation handle 20 (referring to figure 3 in particular) arranged on said base 10, an ancillary operation handle 20' arranged on said base 10 concentrically with said main operation handle 20, and a

coupler 30' (referring to figure 3 in particular) which is arranged on said base 10, connected with a linkage mechanism 200 and driven by said main operation handle 20 and/or the ancillary operation handle 20'. Said base 10 is provided with a rotating shaft 12 and a rotating shaft 14.

[0016] Said main operation handle 20 comprises a handle 22, a body 24 and a projecting edge 26 which are connected serially. Said handle 22 is for operation. Said body 24 is provided with a hole 242 and receives the rotating shaft 12 of said base 10 through the hole 242. Said projecting edge 26 is arranged on the external surface of said body 24. Preferably, the body 24 of said main operation handle 20 is a cylinder, and said projecting edge 26 is arranged on the external circumference of said body 24.

[0017] Said ancillary operation handle 20' comprises a handle 22', a body 24' and at least one tooth 28' which are connected serially. Said handle 22' is for operation. Said body 24' has a hole 242' and receives the rotating shaft 12 of said base 10 through the hole 242'. Said at least one tooth 28', preferably a plurality of teeth 28', are arranged on the external surface of said body 24', and preferably said teeth 28' are equally spaced and distributed on the external surface of said body 24'. Preferably, the body 24 of said operation handle 20 is a cylinder, and said at least one tooth 28' is arranged on the external circumference of said body 24.

[0018] In conclusion, the main operation handle 20 receives the rotating shaft 12 of said base 10 in the upper through the hole 242 in the body 24, and the ancillary operation handle 20' receives the rotating shaft 12 of said base 10 in the lower through the hole 242' in the body 24' such that when activated, the main operation handle 20 and the ancillary operation handle 20' can rotate round said rotating shaft 12 independently.

[0019] Said coupler 30' comprises a connecting part 32' and, a body 34', which are connected serially, and a projecting edge 36' and at least one tooth 38' which are separately connected with said body 34'. Said connecting part 32' is connected with said linkage mechanism 200. Said body 34' has a hole 342' and receives the rotating shaft 14 of said base 10 through the hole 342'. Said projecting edge 36' and said at least one tooth 38', preferably a plurality of teeth 38', are arranged on the upper and lower external surface of said body 34' respectively, and when there are a plurality of teeth 38', preferably said plurality of teeth 38' are equally spaced to distribute onto the external surface of said body 34'. The projecting edge 36' of said coupler 30' and the projecting edge 26 of said main operation handle 20 are corresponding to each other and mate with each other in operation. At least one tooth 38' of said coupler 30' is corresponding to and mates with at least one tooth 28' of said ancillary operation handle 20'. Preferably, the body 34' of said coupler 30' is a cylinder, and said projecting edge 36' and at least one tooth 38' are arranged on the external circumference of said body 34'.

[0020] When the handle 22 of said main operation handle 20 is operated, said handle 22 will drive said body 24 to rotate around the rotating shaft 12 of said base 10 and drive said projecting edge 26 to rotate as well. The projecting edge 26 of said operation handle 20 is pressed against and drives the projecting edge 36' of said coupler 30'. Said projecting edge 36' is driven to rotate the body 34' of said coupler 30' around the rotating shaft 14 of said base 10 and to rotate said connecting part 32' as well. As said connecting part 32' is connected with said linkage mechanism 200, the rotation of said connecting part 32' drives said linkage mechanism 200 to move so as to open or close a switch contact.

[0021] Similarly, when the handle 22' of said ancillary operation handle 20' is operated, said handle 22' will drive said body 24' to rotate around the rotating shaft 12 of said base 10 and drive said at least one tooth 28' to rotate as well. At least one tooth 38' of said ancillary operation handle 20 mates with and drives at least one tooth 38' of said coupler 30'. Said at least one tooth 38' is driven to rotate the body 34' of said coupler 30' around the rotating shaft 14 of said base 10 and to rotate said connecting part 32' as well. As said connecting part 32' is connected with said linkage mechanism 200, the rotation of said connecting part 32' drives said linkage mechanism 200 to move so as to open or close a switch contact.

[0022] To sum up, the projecting edge 26 of said main operation handle 20 is mated with the projecting edge 36' of said coupler 30', and the tooth 28' of said ancillary operation handle 20' is mated with the tooth 38' of said coupler 30' so that both main and ancillary operation handles can independently drive said coupler 30', thereby driving said linkage mechanism 200 connected with said coupler 30' to move so as to open or close a switch contact. Therefore, when the state of said main operation handle 20 is not changed, or when the main operation handle 20 is not suitable for operation, said ancillary operation handle 20' can be operated to drive said mechanism connected with the coupler 30', such as said linkage mechanism 200 or other mechanisms, without operating said main operation handle 20 or affecting the current state of said main operation handle 20.

[0023] Figure 4 illustrates an embodiment of the duel-operation handle device 300 of the present invention applied in a low-pressure switch, such as alarm switch 1. In said alarm switch 1, the duel-operation handle device 300 of the present invention is operated to drive the linkage mechanism 200 connected therewith to move accordingly to open or close a switch contact 400. Particularly, when the state of the main operation handle 20 of said duel-operation handle device 300 is not changed, or when the main operation handle 20 is not suitable for operation, said ancillary operation handle 20' can be operated to drive said linkage mechanism 200 connected with said coupler 30', without operating said main operation handle 20 or affecting the current state of said main operation handle 20.

[0024] Although the exemplary embodiments of the

present invention have been described above with reference to the drawings, it should be understood that the present invention is not limited to the above-described embodiments, and other variations or adaptive modifications made by those skilled in the art according to the present invention do not depart from the scope and spirit of the invention.

10 Claims

1. A duel-operation handle device (300) comprising a base (10) with two rotating shafts (12, 14), and a main operation handle (20) and a coupler (30') which are mounted on one of said rotating shafts (12, 14) wherein said main operation handle (20) and coupler (30) are provided with mated projecting edges (26, 36) so that when said main operation handle (20) is operated to turn around the rotating shaft (12), the coupler (30') will be driven by said mated projecting edges (26, 36) to turn around the rotating shaft (14), **characterized in that:**

it further comprises an ancillary operation handle (20') which is arranged on the rotating shaft (12) concentrically with said main operation handle (20) and said ancillary operation handle (20') is provided with at least one tooth (28'); said coupler (30') is further provided with at least one tooth (38') which engages with the tooth (28') of said ancillary operation handle (20') so that when said ancillary operation handle (20') is operated to turn round the rotating shaft (12), the coupler (30') will be driven by said engaging teeth (28', 38') to turn round the rotating shaft (14).

2. The duel-operation handle device as claimed in claim 1 **characterized in that** said ancillary operation handle (20') comprises a handle (22'), a body (24') and said tooth (28') which are connected serially, wherein said handle (22') is used to receive operation, and said body (24') has a hole (242') and receives the rotating shaft (12) of said base (10) through the hole (242'), and said tooth (28') is arranged on the external surface of said body (24').
3. The duel-operation handle device as claimed in claim 2 **characterized in that** the body (24') of said ancillary operation handle (20') is a cylinder, and said tooth (28') is arranged on the external circumference of said body (24').
4. The duel-operation handle device as claimed in claim 2 or 3 **characterized in that** said ancillary operation handle (20') comprises a plurality of teeth (28') and said plurality of teeth (28') are equally spaced and distributed on the external surface of

said body (24').

5. The duel-operation handle device as claimed in claim 1 **characterized in that** said coupler (30') comprises a body (34'), and the projecting edge (36') and tooth (38'), which are connected with said body (34'), wherein said body (34') has a hole (342') and receives the rotating shaft (14) of said base (10) through said hole (342'), and said projecting edge (36') and tooth (38') are arranged on the upper and lower external surface of said body (34') respectively.

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6. The duel-operation handle device as claimed in claim 5 **characterized in that** said coupler (30') further comprises a connecting part (32') which is connected to said body (34') and external mechanism (200) respectively.

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7. The duel-operation handle device as claimed in claim 5 **characterized in that** the body (34') of said coupler (30') is a cylinder, and said projecting edge (36') and tooth (38') are arranged on the external circumference of said body (34') respectively.

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8. The duel-operation handle device as claimed in claim 5 or 7 **characterized in that** said coupler (30') comprises a plurality of teeth (38') and said plurality of teeth (28') are equally spaced and distributed on the external surface of said body (34').

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9. The duel-operation handle device as claimed in either of claims 1, 2 and 5 **characterized in that** said duel-operation handle device (300) is used in a low-voltage switch (1).

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10. The duel-operation handle device as claimed in claim 9, **characterized in that** said low-voltage switch (1) is an alarm switch.

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FIG 1

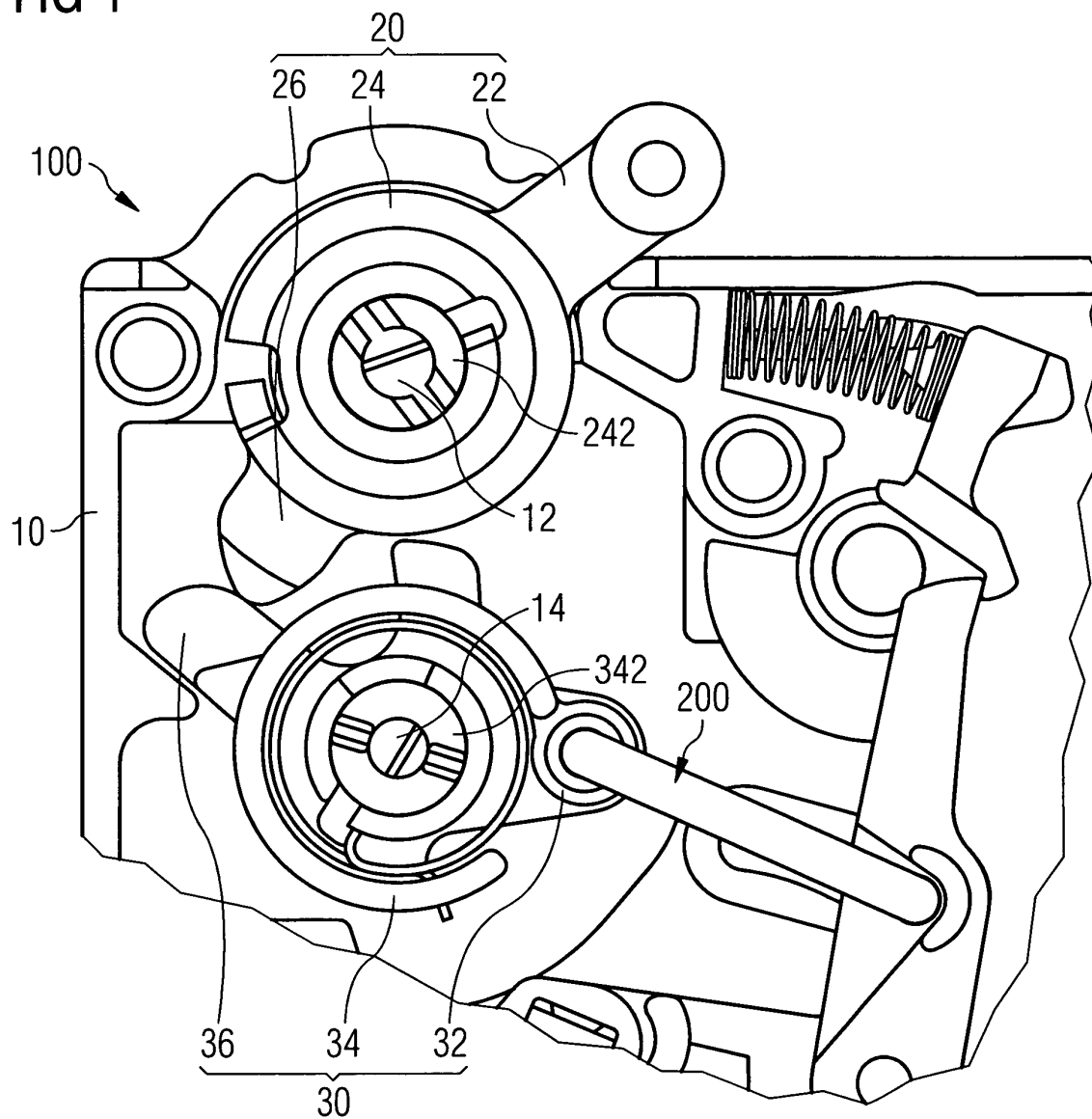


FIG 2

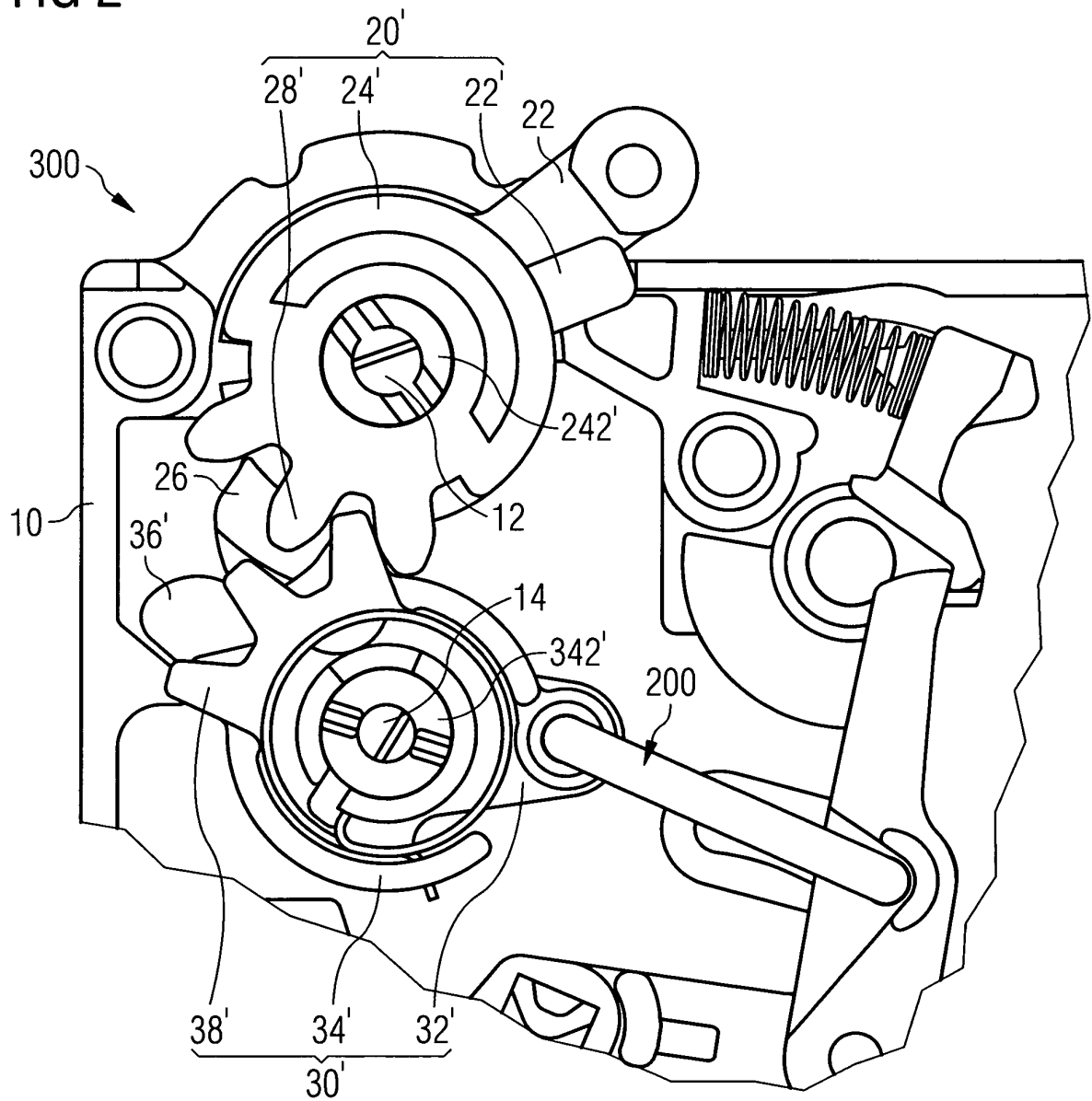


FIG 3

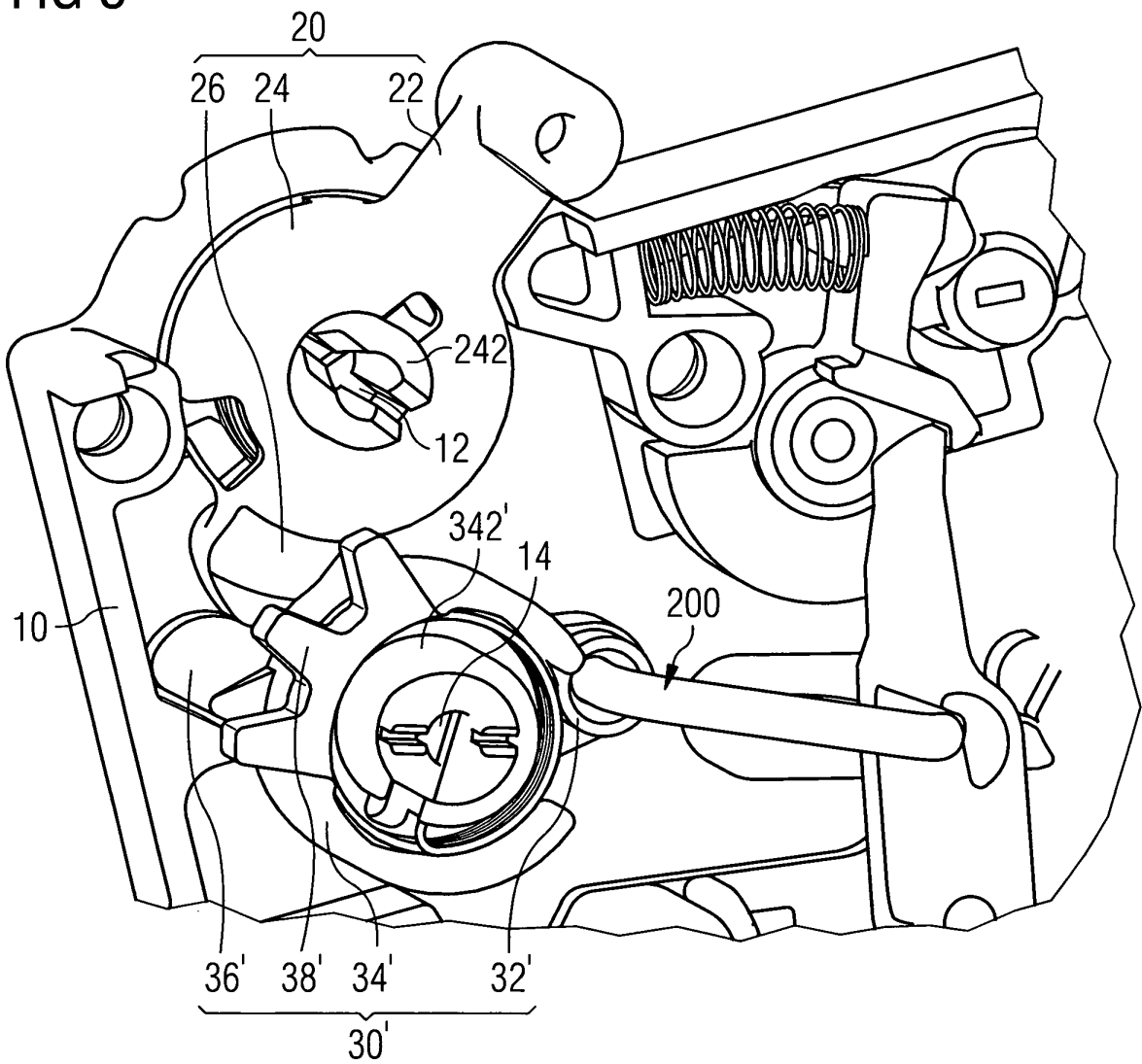


FIG 4

