April 2, 1946. C. ARCULARIUS 2,397,828

CONTROL HANDLE

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Fig. 1

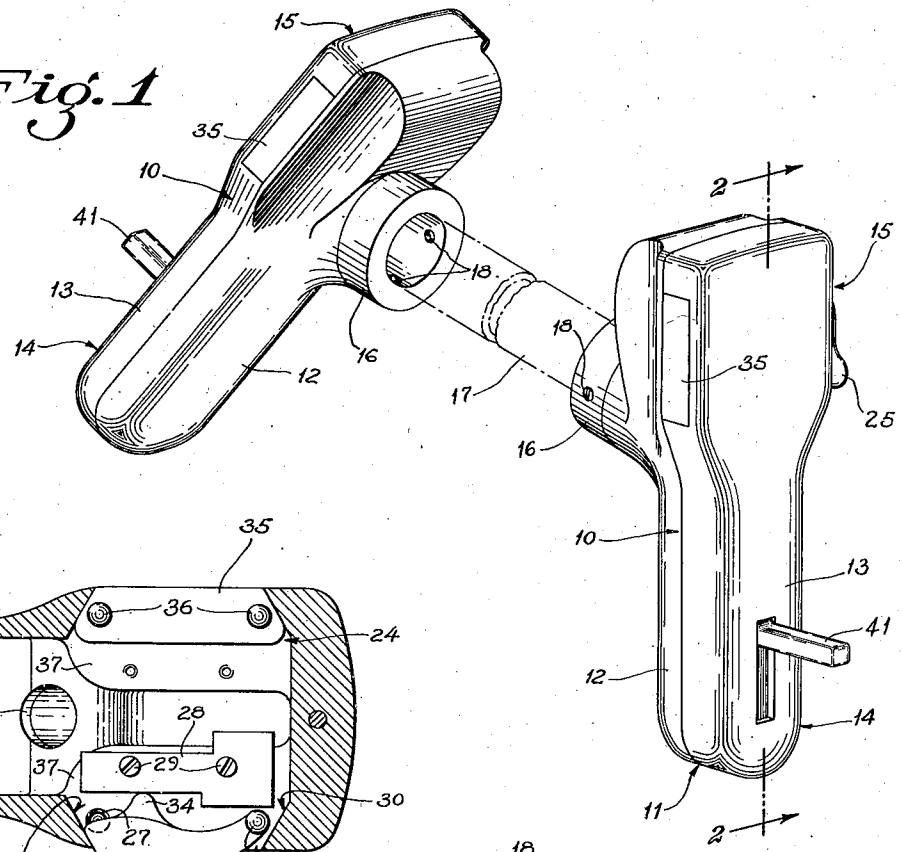

Fig. 3

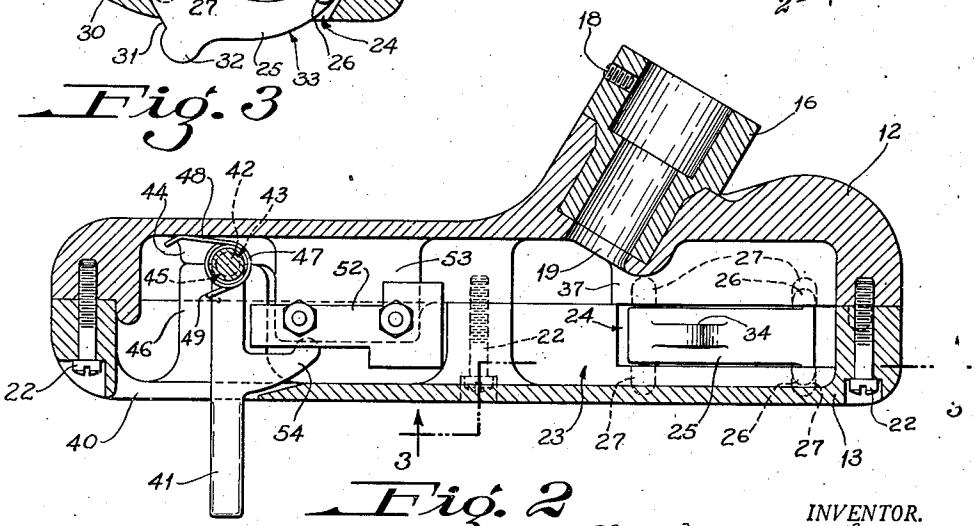

Fig. 2

INVENTOR.
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BY
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his ATTORNEYS

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Fig. 4

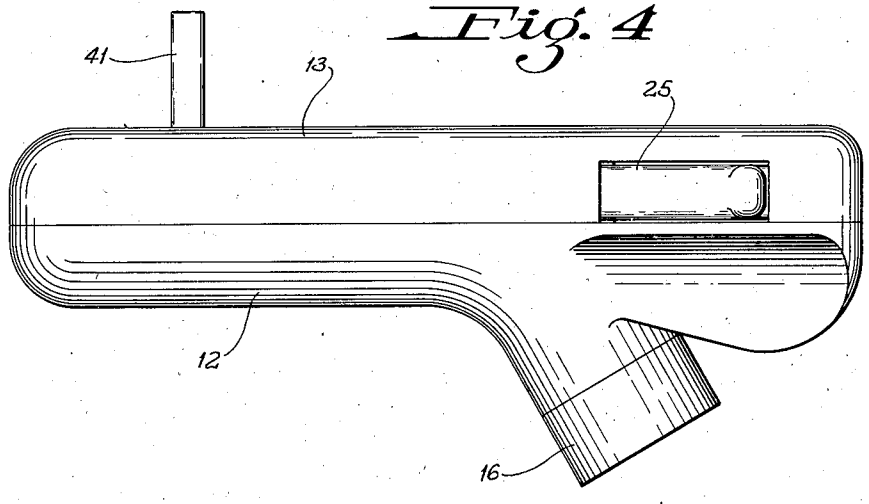
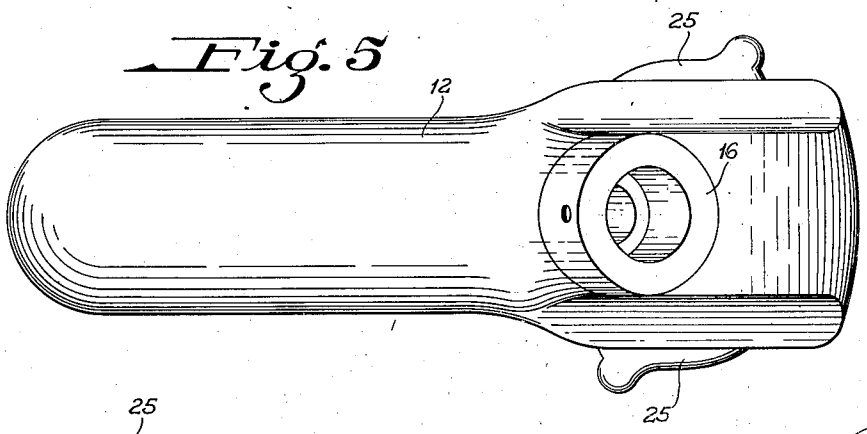


Fig. 5



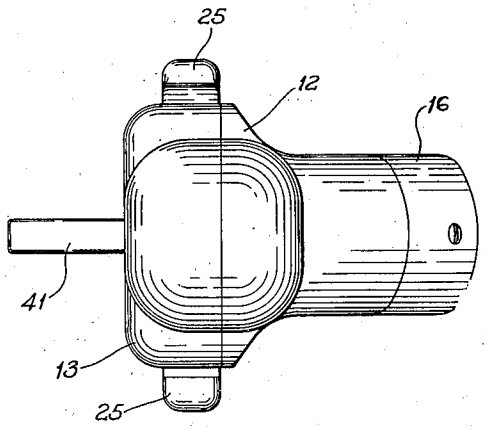


Fig. 7

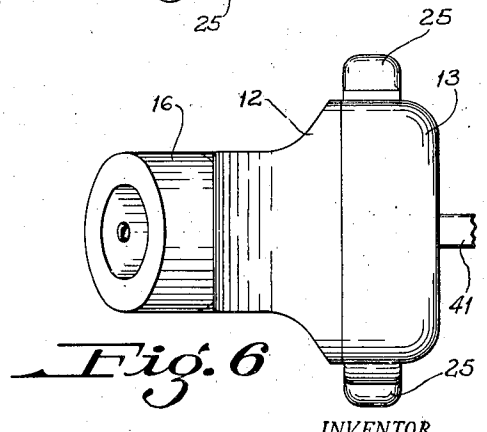


Fig. 6

INVENTOR.
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Patented Apr. 2, 1946

2,397,828

UNITED STATES PATENT OFFICE

2,397,828

CONTROL HANDLE

Charles Arcularius, New Canaan, Conn., assignor, by mesne assignments, to The W. L. Maxson Corporation, New York, N. Y., a corporation of New York

Application February 11, 1943, Serial No. 475,591

2 Claims. (Cl. 200—157)

This invention relates to control handles for electrically controlled guns and is especially suitable for use in connection with gun training and firing systems of the type employed in turrets. Such systems may include a control lever having a cross bar provided with control handles at its ends, which carry control switches for various electrically operated devices including firing triggers, intercommunication system switches and the like. In view of the fact that the handles are advantageously contoured to provide a firm and comfortable grip fitting the hand, and the switches must be located for operation by the proper fingers, the location of such switches on the left handle is necessarily the reverse of that employed on the right handle. Consequently it has been necessary to employ different designs for the two handles and to manufacture them separately.

The general purpose of the invention is to provide improvements in the general construction and arrangement of handles of the indicated type. One feature of the invention is the provision of a construction which employes the same parts for both handles, arranged so that either a right or a left handle may be assembled from the same parts by slight rearrangement thereof. Another feature is to provide a simple and strong construction which can be manufactured readily from synthetic resins or other materials adapted for casting or molding.

Other objects and advantages will appear from the following description considered in connection with the accompanying drawings in which:

Fig. 1 is a perspective view of a pair of handles in position at the ends of a control lever cross piece;

Fig. 2 is a longitudinal transverse section through one of the handles on line 2—2 of Fig. 1;

Fig. 3 is a fragmentary cross section through the upper end of a handle on line 3—3 of Fig. 2 with parts broken away;

Fig. 4 is a side elevation view of a handle provided with a dead man's switch;

Fig. 5 is an inner face view of said handle provided with operating switches at both sides;

Fig. 6 is a top plan view; and

Fig. 7 is a bottom view of said handle.

The handle 10 includes a body 11 formed from a case 12 and a cover 13, detachably connected and enclosing the operating parts. The body 11 is contoured to provide a downwardly extending grip portion 14, a head 15 and a mounting socket 16 which may be mounted on either end of control lever cross piece 17 and held in place as by set screws 18.

The case 12 (Fig. 2) is advantageously formed of molded or cast synthetic resin. The mounting socket 16 may be of metal, and may be fixed in place in the case at the molding or casting of the case. The socket 16 is provided with a central passage 19 which communicates with the interior of the case and with the end of hollow cross piece 17, for providing a conduit through which the lead wires may extend from the handle through the control lever.

The cover 13 is detachably mounted on case 12 by screws 22; and the inner faces of the cover and case 12 are suitably hollowed out to form a space or spaces in which the switches, leads and operating levers or triggers may be located. In the form illustrated a central compartment 23 is provided, extending into both the case 12 and cover 13.

One operating switch is advantageously located at the side of the head 15 where it may be operated by the index finger of the gunner if the switch is at the rear of the handle, and by the thumb of the gunner if the switch is in front. The cover 13 is provided with openings 24 at both the front and the back of the head 15, each adapted to receive a finger piece or trigger 25. In the illustrated form the finger piece 25 is provided adjacent one end with laterally extending pivot studs 26 which rotatably fit in aligned sockets 27 formed in contiguous portions of the case 12 and cover 13. A suitable switch 28 is mounted in case 12, as by screws 29, in register with the finger piece 25. The opposite ends 30 of opening 24 advantageously converge toward the outside of the handle, overlying the ends of finger piece 25 and providing a stop for the free end thereof which is normally pressed outwardly by spring pressure from switch 28.

Various types of switch and finger piece construction may be employed. The form illustrated is a finger piece 25 whose free end face 31 registers with the adjacent end 30 of opening 24 and is provided with a transverse projection 32 which merges with the outer face 33 of the finger piece and is shaped for ready and comfortable engagement by the gunner's finger. A knob 34 extends inwardly from the finger piece into position for engagement with a spring pressed actuating element (not shown) of switch 28.

The symmetrical opening 24 on the opposite side of the handle head 15, as shown in Figs. 1–3, is provided. This opening may be closed by a filler block 35 which snugly fits the opening. The filler

block 35 is desirably held in place by retaining studs 36 which are provided at opposite sides of the block adjacent each end thereof, and which fit into opposed pairs of sockets 27 formed in the case 12 and in the cover 13, respectively. The case 12 is provided with switch mounts 37 adjacent end openings 24. With this arrangement a switch 28 and its finger piece 25 may be located at either side of the body 10 or, if desired, a switch may be mounted at each side as in the arrangement illustrated in Figs. 4–7. The finger piece 25 may likewise be positioned with the projection 32 at either end of opening 24 by locating the pivot studs 26 in the appropriate aligned pair of sockets 27, and by mounting switch 28 in the proper position relative to finger piece 25. A switch construction of the latter type is illustrated in Figs. 1, 2, 4, 6 and 7, and is arranged for use as a dead man's switch, of the type which cuts out of operation appropriate parts of the apparatus controlled from the handle when the switch is not in operation by the hand of the gunner.

In the construction illustrated (Fig. 2) the case 13 is provided with an opening 40 extending along the center line of its outer face at the lower end of the grip portion 14. A switch lever 41 extends through opening 40 and is pivotally mounted at its inner end by studs 42 which rotatably fit into semi-cylindrical sockets 43 formed in bosses 44 on case 12 and into registering semi-cylindrical sockets 45 formed in lugs 46 on cover 13. The lugs 46 extend into case 12 into register with bosses 44 when the body 11 is assembled. A coil spring 47 on one of the pivot studs 42 has an inner end 48 bearing against the interior of case 12 and a hook shaped outer end 49 extending around the adjacent lower face of lever 41, arranged to bias said lever upwardly.

A suitable switch 52 is mounted on boss 53 in the case 12, and is engaged by a lug 54 on lever 41 bearing against a spring pressed operating element (not shown) of the switch, the coil spring 47 being of sufficient strength to throw the switch by the pressure of lug 54 against said element. The outer end of lever 41 is located for engagement by the lower edge of the gunner's hand, which will depress the lever and release switch 52 when the hand is in normal position gripping handle 10; but upon removal of the hand the spring 47 will move lever 41 upwardly and throw switch 52.

The parts including the case 12, cover 13, finger piece 25, filler block 35 and lever 41 are adapted for construction from molded or cast synthetic resins, though they can likewise be made in other ways and from other materials, such as wood or metal, with the provision of suitable insulation where necessary.

I have described what I believe to be the best embodiments of my invention. I do not wish, however, to be confined to the embodiments shown, but what I desire to cover by Letters Patent is set forth in the appended claims.

I claim:

1. A control handle including, in combination, a hand-fitting body, a switch construction including a digitally operable actuating member, a switch mounting construction within the body arranged to support the switch in either of two laterally symmetrical positions suitable for rendering the handle, according to the choice of switch mounting, distinctively a handle for right hand use or distinctively a handle for left hand use, said body having laterally symmetrical openings for alternatively accommodating the switch-actuating member, mounting elements for the switch-actuating member carried by said member and by the body adjacent to each opening, a removable filler for an unused opening, and mounting elements on the filler for cooperating with said mounting elements on the body.

2. A hand grip handle and switch assembly adapted distinctively for use by one hand of an operator but fully convertible into a mirror image assembly adapted distinctively for use by the other hand of the operator, said assembly comprising a handle casing composed of separable complementary casing sections, each of symmetrical construction with respect to a transverse longitudinal median plane of symmetry, means for securing the casing sections to one another in predetermined relation, means within the casing for supporting a switch on either side of said plane and with either end toward the operator, a digitally operable switch actuating lever having aligned fulcrum trunnions, and said casing sections being formed at each side of the plane of symmetry with two pairs of aligned bearing recesses for receiving the respective trunnions, each of the four pairs of bearing recesses being located to provide pivotal support for the actuating lever in cooperative relation to the switch in one of the four ways that the switch may be mounted, and a filler block having two pairs of aligned dowel pins adapted to fit in the two pairs of bearing recesses at either side of the plane of symmetry of the casing.

CHARLES ARCULARIUS.