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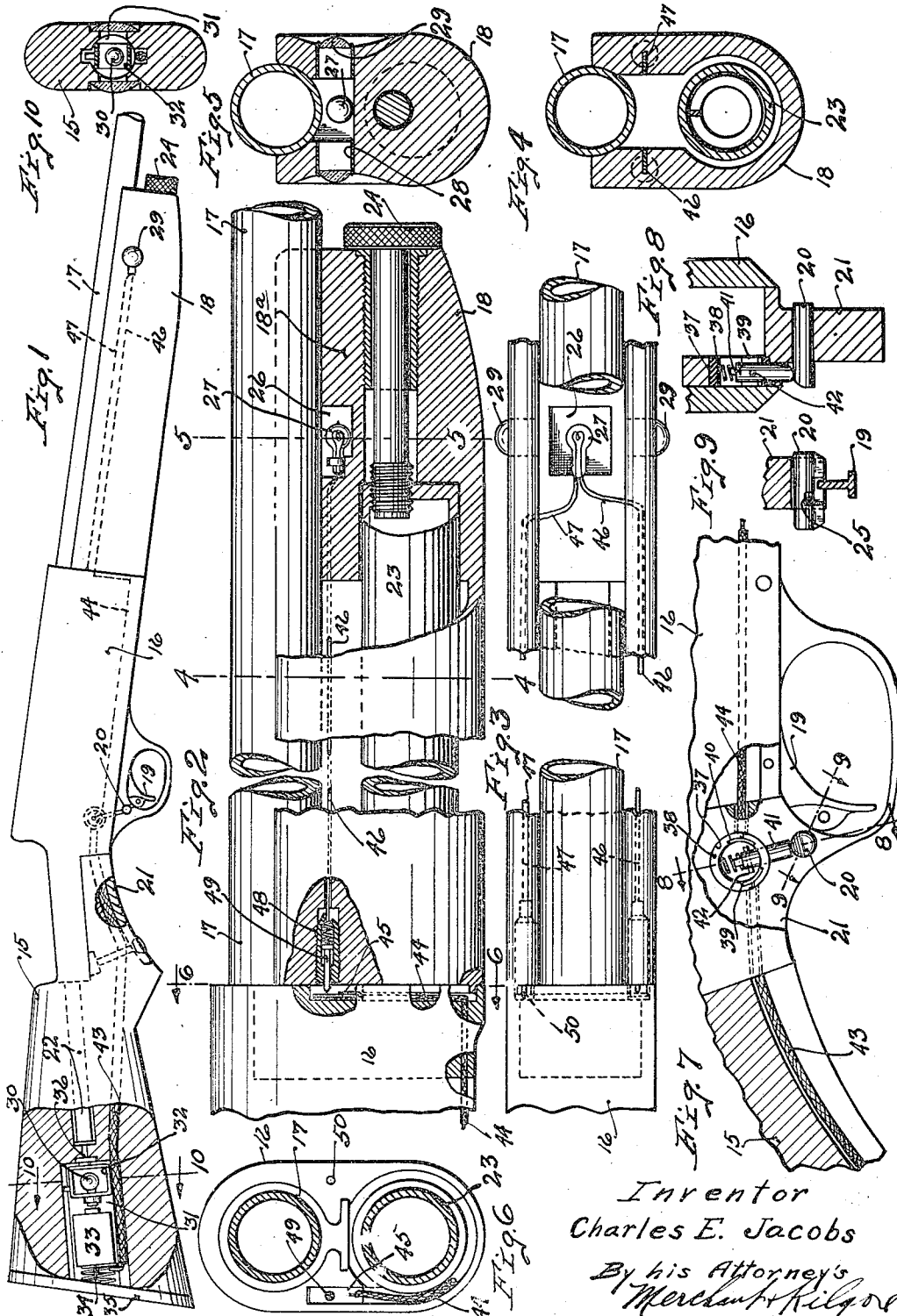
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ILLUMINATED SAFETY INDICATOR FOR GUNS

Filed May 17, 1937

2 Sheets-Sheet 1



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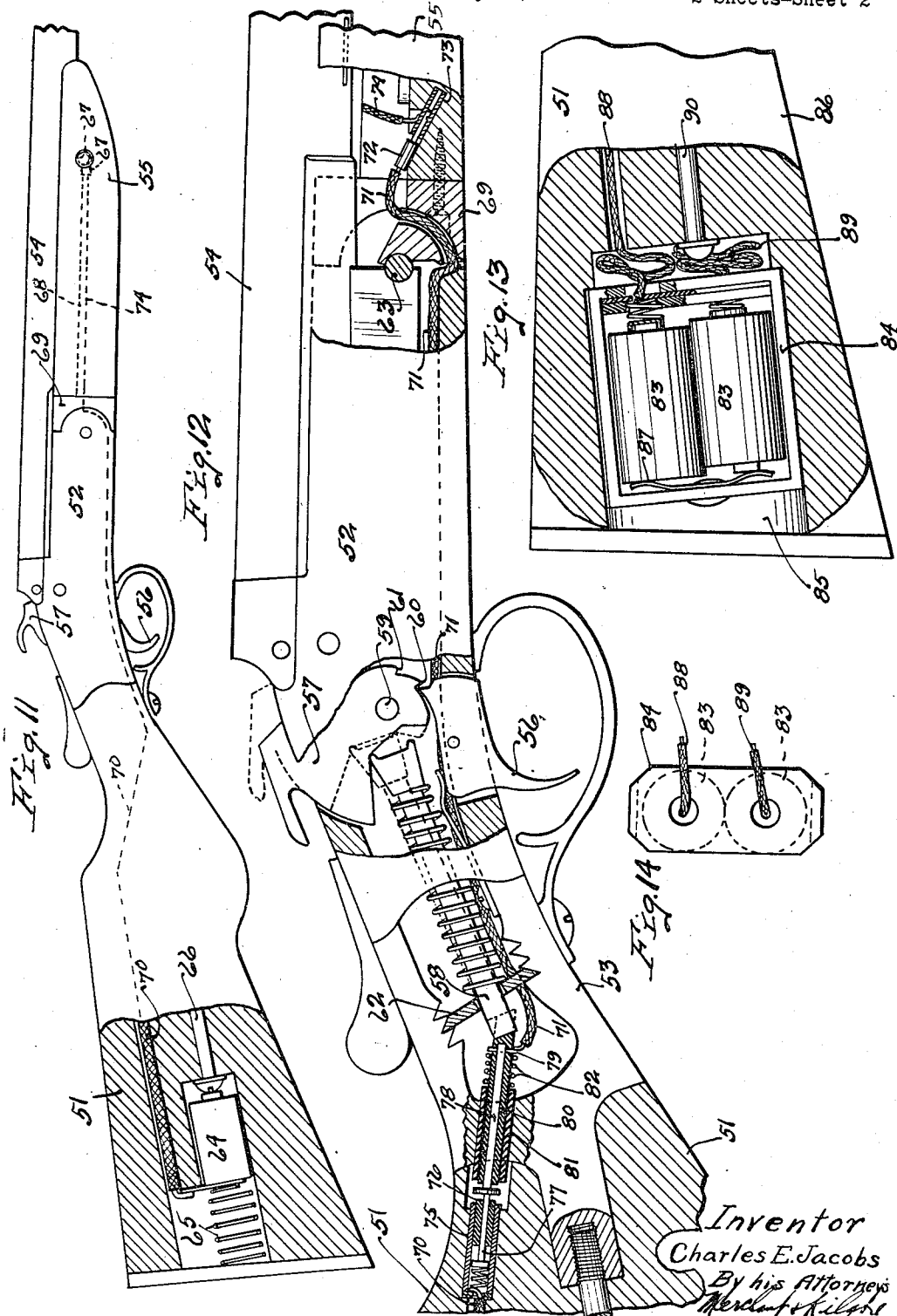
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UNITED STATES PATENT OFFICE

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ILLUMINATED SAFETY INDICATOR FOR GUNS

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9 Claims. (Cl. 42—1)

My present invention relates to guns, this term being used in a broad sense to include rifles, shotguns and similar firearms; and, generally stated, the invention consists of the novel devices, combinations of devices and arrangement of parts hereinafter described and defined in the claims.

The danger of carrying guns in condition for firing is too well known to need comments. Safety devices that produce sound have been found impractical for several reasons, among which may be mentioned the fact that the sound produced will scare game, and under most general conditions a noisy device is not desired. Projectable signals that are not illuminated, and hence not generally seen unless special attention is called thereto, are not efficient.

I have, however, found that illuminated signal devices such as produced by the lighting of a bulb, and especially when combined with means for producing a red glow, the color indicating danger, are very efficient and not objectionable for any reason. I have further found that to be the most efficient these illuminated signal or light producing elements should be placed well along the forward portion of the gun where they will always be seen by the person handling the gun as when ready to fire or even handling the gun in the ordinary way where the line of vision is usually directed to the front portion of the gun. Shotguns and rifles and especially repeating guns are equipped with detachable "fore-ends" or wooden pieces with which the hand is usually engaged in shooting the gun. These "fore-end" pieces are very prominent parts of the gun and are always in the line of vision, and, hence, as an important additional feature I apply illuminated signal devices in these "fore-end" pieces and by a novel arrangement of switch and electrical connections to a storage battery carried in the gun stock, provide means for automatically causing the signal devices to be illuminated whenever the gun is in condition for firing. The invention also involves a novel, highly efficient and simple switch arranged to be actuated by the safety lock of the gun.

In the accompanying drawings, which illustrate the invention, like characters indicate like parts throughout the several views.

Referring to the drawings:

Fig. 1 is a side elevation, but with some parts broken away showing a gun such as a rifle and embodying my invention;

Fig. 2 is a fragmentary view in side elevation with many of the parts broken away and with some parts sectioned showing the intermediate portion of the gun of Fig. 1, both the front end and the rear end portions of the gun being broken off;

Fig. 3 is a plan view of the parts shown in Fig. 4, certain parts being broken away;

Fig. 4 is a transverse section taken on the line 4—4 of Fig. 2;

Fig. 5 is a transverse section taken on the line 5—5 of Fig. 2;

Fig. 6 is a section taken on the line 6—6 of Fig. 4;

Fig. 7 is a fragmentary view partly in elevation and partly in vertical section showing the trigger, safety lock and switch of the gun;

Fig. 8 is a section taken on the line 8—8 of Fig. 7;

Fig. 9 is a section taken on the line 9—9 of Fig. 7;

Fig. 10 is a transverse section taken on the line 10—10 of Fig. 1;

Fig. 11 is a side elevation illustrating a modified form of the invention and showing a single barrel gun of the exposed hammer type;

Fig. 12 is a side elevation with some parts broken away and some parts sectioned showing the intermediate portion of the gun illustrated in Fig. 11;

Fig. 13 is a view partly in elevation and partly in vertical section showing the butt end of a gun and illustrating a modified form of battery structure; and

Fig. 14 is an elevation of the battery shown in Fig. 13.

The invention, as shown in the drawings illustrated in Figs. 1 to 10 inclusive, will first be described. Of the ordinary or standard parts of this gun it is only necessary for the purposes of this case to particularly note: The gun stock or butt 15, the metallic receiver 16, the barrel 17, the fore-end piece 18, the trigger 19, the safety lock bolt 20 and the metallic breech frame 21, which latter is formed as a rigid part of the receiver 16 and includes a metallic tubular spring casing 22, which latter is rigidly secured to the receiver 16 and is extended into a recess formed in the stock 15. The receiver 16 has a forwardly projecting tubular casing 23 which, at its rear end, is rigidly secured to the front end of the body of the receiver 16 and extends parallel to but under the barrel 17. The fore-end piece 18, as shown, is made channel-shaped throughout its main portion so that it fits against the bottom of the barrel 17 and encloses the tube 23. In the front end of the fore-end piece 18 is a swivelled cap screw 24 that is screwed into the front end of the casing 23 and, when applied, rigidly but detachably holds the fore-end piece in position.

The safety lock bolt 20, see particularly Figs. 7, 8 and 9, is slidably mounted in the depending flange of the breech frame 21 just back of the depending portion of the trigger 19 and is formed with a notch 25, which, when aligned with the rear flange of the trigger 19, permits the trigger

to be pressed backward to produce the firing action. When said lock bolt is in the position shown in Figs. 8 and 9, it positively locks the trigger against such rearward movement or hammer releasing action. When the said safety bolt, however, is moved toward the left in respect to Fig. 9 as far as it will go, it permits the trigger to be moved rearward and to produce the firing action.

The cross-sectional form of the fore-end piece 18 and its relation to the barrel is best shown in Figs. 4 and 5, by reference to which it will be noted that its main body portion is channel-shaped so that it presents laterally spaced flanges above the casing 23. The front portion of the said fore-end piece 18 is, however, formed with a solid portion 18a immediately under the barrel and through which the cap screw 24 is passed.

In carrying out my invention this solid portion 18a is formed with a large notch or recess 26 in which is located a small electric light bulb 27 located in the vertical plane that intersects the axes of the barrel 17 and bolt 24. In line with the recess 26 and with the light bulb 27 the sides of the fore-end piece 18 have opposite light passages in which preferably are placed metal tubes 28, in the outer ends of which are lenses 29, advantageously colored red.

As an additional safety means another small light bulb 30 is placed in a recess or bore 31 formed in the rear portion of the stock 15. In the arrangement shown the light bulb 30 is contained within a small metallic frame 32 to which the one terminal of the socket of the light bulb is electrically connected. The terminal of said light bulb, being insulated from said frame and connected to one terminal of a storage battery 33, is also placed in a recess or bore 31. The battery 33, as shown, is forwardly pressed by a light coil spring 34 pressed between the same and a shoulder plate 35 of the gun stock. The metallic frame 32 by a rivet-like structure 36 is electrically connected to the tubular extension 22 of the metallic receiver 26, so that the said elements become a part of the electric circuit presently to be more fully described and which electric circuit includes a controlling switch, which will now be described.

Immediately above the safety bolt 20 the metallic breech frame 21 is formed with a recess 37 which, as shown, is aligned with a bushing 38 of material that is an electrical insulator such as rubber or wood fibre. Set into this bushing 18 is a pair of spaced electrical contact plates 39 and 40. Slidable radially through the bushing 38 is a downwardly spring pressed switch-actuating plunger 41, which is of an insulating material such as noted above and the lower end of which normally rests against the safety bolt 20, as shown in Fig. 8. The switch plunger carries a transversely projecting metallic switch contact 42, which, in the normal position of the parts shown in Fig. 7, that is the lock position of the trigger, is held out of engagement with the contact plates 39 and 40. When, however, the safety bolt 20 is moved toward the right, in respect to Figs. 8 and 9, into a trigger releasing position, which renders the gun in condition for firing, the bevelled end of the safety bolt will engage the bevelled end of the switch plunger, thereby permitting the plunger to lower the contact 42 into engagement with the contact plates 39 and 40, and this, of course, will close the lamp circuits from the battery.

These lamp circuits further traced are as follows: The switch contact plate 39 is connected

to the rear terminal of battery 23 by an insulated wire 43 that is extended through passages in the breech frame and in the gun stock, as best shown in Figs. 1 to 7. The switch plate 40 is connected to the rear end of an insulated wire 44 that is extended through a passage in the receiver 16 to the front end of the latter, where it is extended upwardly on one side and electrically connected to a contact plate 45 that is insulated from the metal body of said receiver and has an exposed front face, as best shown in Figs. 2 and 6. The terminals of the socket of light bulb 27 are connected to insulated wires 46 and 47. The wire 46 is extended in a groove formed in one side of the fore-end piece 18, and the wire 47 is extended in a groove formed in the opposite side of said end piece. The rear end of wire 46 is electrically connected to the end of a metallic bushing 48 that is set into the wooden body of said end piece 18, see particularly Fig. 2. In the bushing 48 is a rearwardly spring pressed contact pin 49 which, when the end piece is applied, electrically contacts with the contact plate 45, see Figs. 2, 3 and 6. The rear end of wire 47 is connected to a rearwardly spring pressed contact pin 50 which is preferably mounted in the same manner as the pin 49 but which, when the fore-end piece 18 is applied, has direct electrical contact with the front end of the receiver 16. Complete electric connections from the battery 33 to the light bulbs 27 and 30 have now been traced, and it should be understood that both light bulbs will be illuminated whenever the safety bolt 20 is moved to a position to align its notch 25 with the flange of the trigger 19 and thereby set the gun in condition for firing.

Adviseably the wires 46 and 47 in the grooves of the flanges of the fore-end piece 18 are embedded in a set plastic material to better hold them in position, but it also is evident that the electrical connections described will automatically connect the electric circuits for performing their described functions by the very act of applying the fore-end piece in working position.

Figures 11 and 12 illustrate a single barrel gun of the type wherein an exposed hammer is used. The major parts of this gun may be briefly noted as follows: The numeral 51 indicates the stock, 52 the magazine which is rigid with the metallic breech frame 53, the numeral 54 the barrel, the numeral 55 the removable fore-end piece, the numeral 56 the trigger, the numeral 57 the hammer, and the numeral 58 the forwardly spring pressed hammer-actuating bolt. The hammer 57 is pivoted at 59 and is provided with ratchet-like teeth 60 and 61 that co-operate with the trigger 56, respectively to set the hammer for firing or at "half cock". Here it is only necessary to state that when the hammer is at full cock and is released by a trigger, it will be violently thrust forward into firing position under the action of the spring pressed bolt 58, which reacts against a base plate 62 secured in the breech frame 53. In guns of this type the barrel 54 is pivoted to the fore-end portion of the magazine 52 on a pivot 63. In this gun the storage battery 64 is set in a recess in the gun stock and is pressed forwardly by a spring 65 that holds one terminal of the battery against the head of a long bolt 66. This bolt 66 is such as is found in guns of this type and is there used to rigidly connect the gun stock to the metallic breech frame 53 so that one terminal of the battery is grounded through a metallic structure of the gun. In this gun the light bulb 67 is placed in the removable

fore-end piece 55, which latter is formed with the sight openings at opposite sides preferably in the same manner as the gun previously described.

The body of the fore-end piece 55, being of wood, is a non-conductor of electricity, but at its rear end it is provided with a metallic joint block 69 which, when the fore-end piece is applied, has direct electrical contact with the metallic front end portion of the magazine 52. One terminal of the socket of light bulb 67 is connected by a wire 68 to the metallic block 69 so that one terminal of said light bulb is, through the metallic parts noted including the bolt 66, connected to one terminal of the battery 64. The other terminal of battery 64 is connected to the rear end of an insulated wire 70 that is extended forwardly through the gun stock and by a switch mechanism, presently to be described, is connected to another wire 71 that is extended forwardly through the lower portion of the magazine 52 and terminates in a contact pin 72. The contact pin 72 is telescoped into a metallic contact sleeve 73 that is set into the wooden body of the fore-end piece 55. The sleeve 73, by a wire 74, is connected to the other terminal of the socket of the light bulb 67.

The switch mechanism for controlling the signal device under the action of cocking the hammer 57 for firing is shown in axial section in Fig. 12 and is as follows: The front end of wire 70, as shown, is connected to a metallic sleeve 75 set into the woodwork of the gun stock 51 and provided at its front end with a bushing 76 of insulating material. A forwardly spring-pressed contact metallic plunger 77 that is headed at both ends works through the bushing 76 and is arranged to be engaged with the front end of a contact plunger 78 by a metallic pin 79 driven through said plunger and a sleeve 80, so that said plunger and sleeve move together. The rear end of plunger 77 is subject to a coiled metal spring 77' that electrically connects the same to the front end of wire 70. Plunger 78 works through the sleeve 80 which in turn slides through a bushing 81 set into the gun stock. Sleeve 80 is of insulating material and its front end is normally pressed into engagement with the rear end of the action plunger 58 by a light coil spring 82.

The action of the switch mechanism just described is as follows: When the hammer 57 is in firing position or at half cock, plunger 58 will be so far forwardly moved that sleeve 80 with contact pin 78 will be withdrawn into the fixed sleeve or bushing 81, thereby moving plunger 78 out of engagement with plunger 77 and breaking the circuit. When, however, the hammer is set for firing, as shown by full lines in Fig. 12, plunger 58 will be forced so far forward that contact plunger 78 will be engaged with contact plunger 77, thereby closing the circuit and causing the signal-like lamp to be illuminated.

In Figs. 13 and 14 I have shown a duplex battery made up of two cells 83 set in reverse order in a rectangular frame 84, which in turn is seated in a recess 85 formed in the gun stock 86. In this arrangement opposite terminals of the cells 83, as shown, are connected by a metallic piece 87, and the other terminals of the said cells are connected, one to a wire 88 that leads to one terminal of the light bulb, and the other by a wire 89 that leads to the other terminal of said light bulb through a butt securing bolt 90 and other metallic parts of the gun.

What I claim is:

1. In a gun of the kind described provided with a fore-end piece extended under the forward portion of the gun barrel and provided with sight openings at its opposite sides, an electric light bulb located in said fore-end piece between the sight openings thereof, a battery located in the gun stock, a circuit for said light bulb including said battery and light bulb and a circuit controlling switch, and means operated by setting of the gun in condition for firing and operating on said switch to close the light bulb circuit and cause illumination thereof.

2. In a gun of the kind described provided with a fore-end piece extended under the forward portion of the gun barrel and provided with sight openings at its opposite sides, an electric light bulb located in said fore-end piece between the sight openings thereof, a battery located in the gun stock, a circuit for said light bulb including said battery and light bulb and a circuit controlling switch, a trigger lock, and a switch-actuating element co-operating with said trigger lock and arranged to open said switch when the trigger lock is in position to lock the trigger, and to close said switch when said trigger lock is in position to release the trigger for firing action.

3. The structure defined in claim 1 in which said fore-end piece is detachably applied to the gun, and said circuit includes separable contacts arranged to be engaged when said fore-end piece is applied to the gun.

4. The structure defined in claim 2 in which said fore-end piece is detachably applied to the gun, and said circuit includes separable contacts arranged to be engaged when said fore-end piece is applied to the gun.

5. The structure defined in claim 1 in which said circuit also includes a light bulb located in the gun stock, said stock having sight openings exposing the second light bulb to view.

6. In a gun of the kind described provided with a fore-end piece extended under the forward portion of the barrel, of a light bulb applied to said fore-end piece, a battery located in the gun stock, a circuit including said battery and light bulb, a switch for controlling said circuit, and means operated by setting of the gun in condition for firing and operating on said switch to cause said light bulb to be illuminated.

7. The structure defined in claim 6 in which said fore-end piece is detachably applied to the gun, and said circuit includes separable contacts arranged to be engaged when said fore-end piece is applied to the gun.

8. The structure defined in claim 6 in which said circuit also includes a light bulb located in the gun stock and arranged to be illuminated when the light bulb in the fore-end stock is illuminated.

9. In a gun of the kind described, a light bulb visibly applied in the front end portion thereof, an electric circuit including a battery, a switch and said light bulb, said elements being incorporated in the gun structure, and means operated by the setting of the gun in condition for firing and operating on said switch to close the bulb circuit and cause illumination thereof, and which gun is provided with a removable fore-end piece and the circuit connections to said light bulb include separable contacts arranged to be engaged by application of the fore-end in working position.

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