US Patent & Trademark Office
Patent Public Search | Text View

United States Patent	12392580
Kind Code	B2
Date of Patent	August 19, 2025
Inventor(s)	Neff; Michael Ilari

Fiber optic handgun sight

Abstract

A firearm sight has a body having an attachment facility configured to connect to a pistol having a forward target end and a rear end. The body has a forward end and an opposed rear end associated with the forward and rear ends of the firearm. The body defines a bore with a forward opening and a rear opening. An elongated insert is received in the bore and has a rear end and a forward end. The insert and body have an insertion limiting facility configured to admit insertion of the insert with the rear end of the insert inserted via the forward opening of the bore, and to prevent passage of the insert beyond a limited insertion amount. The insertion limiting facility may include the bore defining a step, a greater bore width forward of the step and lesser bore width rear of the step.

Inventors: **Neff; Michael Ilari (Parker, TX)**

Applicant: **Neff; Michael Ilari** (Parker, TX)

Family ID: **1000008764823**

Appl. No.: **18/371985**

Filed: **September 22, 2023**

Prior Publication Data

Document Identifier	Publication Date
US 20240102772 A1	Mar. 28, 2024

Related U.S. Application Data

us-provisional-application US 63409381 20220923

Publication Classification

Int. Cl.: **F41G1/34** (20060101); F41G1/10 (20060101); F41G11/00 (20060101)

U.S. Cl.:

CPC **F41G1/345** (20130101); F41G1/10 (20130101); F41G11/003 (20130101)

Field of Classification Search

CPC: F41G (1/345); F41G (1/10); F41G (1/02); F41G (1/32); F41G (11/003)

USPC: 42/132; 42/144; 42/145

References Cited

U.S. PATENT DOCUMENTS

Patent No.	Issued Date	Patentee Name	U.S. Cl.	CPC
4020203	12/1976	Thuler	428/428	F41G 1/32
5065519	12/1990	Bindon	42/145	F41G 1/32
5279061	12/1993	Betz	42/144	F41G 1/34
6122833	12/1999	Lorocco	42/132	F41G 1/32
8635801	12/2013	Glimpse	42/131	F41G 1/32
10386158	12/2018	Kind	N/A	F41G 1/345
11340041	12/2021	Salamon, III et al.	N/A	N/A
11815332	12/2022	Eaton	N/A	F41G 1/28
2012/0144721	12/2011	Glimpse	42/144	F41G 1/10
2014/0109460	12/2013	Howe	42/132	F41G 1/08

Primary Examiner: Cooper; John

Attorney, Agent or Firm: Langlotz Patent & Trademark Works, LLC

Background/Summary

CROSS-REFERENCE TO RELATED APPLICATION (1) This application claims the benefit of U.S. Provisional Patent Application No. 63/409,381 filed on Sep. 23, 2022, entitled “FIBER OPTIC HANDGUN SIGHT,” which is hereby incorporated by reference in its entirety for all that is taught and disclosed therein.

FIELD OF THE INVENTION
(1) The present invention relates to firearms, particularly sights for a handgun. Specifically, illuminated sights.
BACKGROUND AND SUMMARY
(2) Sights used for firearms may implement fiber optic pieces to gather and refract light to present a single or set of illuminated dots to an end user for enhanced target acquisition. Typical fiber optic handgun sights use a system of cylindrical length of plastic that refracts light to create an illuminated end. The sights are formed of material that is a transparent plastic with a fluorescent material that receive ambient ultraviolet light from the sides of the “fiber” and emits visible light from the fluorescing particles, visible vividly at the ends to present an illuminated appearance.
(3) The fibers are installed in typically metal sight bodies that have conventional notch and post configurations. Fiber optic installation typically requires a heat source applied to each end of the fiber to secure the fiber in the desired position within the sight. This approach and method of

installation presents several disadvantages. The installation may result in a poor fit and adhesion of the fiber to the frame of the sights and result in the fiber optic piece falling out due to violent recoil of the slide to which they are mounted. It also presents dangers both to the integrity of the handgun finish and to the user as the heat required may result in burns to the finish or human skin.
(4) Additionally, because the fiber optic is sometimes exposed at both ends of its housing and is thus visible to both the end user and to any potential threat being addressed, posing a danger to the end user. The fiber optic often is recessed within the sight housing, allowing less light to be gathered and thus less visibility of the sights. Further, dirt and debris can become lodged in the recessed area and diminish visibility.
(5) Accordingly, there is a need for a handgun sight system having a better means of installing the fiber optic pieces into the sight housing. The above disadvantages are addressed by a fiber optic sight system using a set screw to secure the fiber optic piece into a sight housing. This sight improves the modularity and functionality of the fiber optic handgun sight concept by using a mechanical means of changing the fiber rod without introducing heat. This sight also improves upon other similar designs in that the replaceable fiber rods are of a proprietary stepped design that allows the rods to be captured without compressive forces, but may be firmly secured to avoid movement within the sight body and retained mechanically with a threaded fastener while extending beyond the opening in the sight body, thereby offering a crisper view of the fiber and higher visibility of the fiber when installed. Also, a feature of this design is the use of fasteners from the muzzle end of the handgun which would direct the fastener and rod forward away from the user in a case where the fastener became loose or failed.

Description

BRIEF DESCRIPTION OF THE DRAWINGS
(1) FIG. **1** is a firearm according to a preferred embodiment of the invention with the sights installed.
(2) FIG. **2** is an exploded view of the front sight of the embodiment of FIG. **1**.
(3) FIG. **3** is a view of the rear sights of the embodiment of FIG. **1**.
(4) FIG. **4** side sectional view of the sight of the embodiment of FIG. **1**.
(5) FIG. **5** shows an enhanced view of the front sight of FIG. **4**.
DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT
(6) FIG. **1** shows a handgun **10** with the sights installed. There is a firearm front sight **12** with a fiber optic insert installed on the slide towards the muzzle end **14** of the handgun, and a set of rear sights **16** with fiber optic inserts installed towards the opposite end of the handgun slide **20**. The sights can be installed via a conventional dovetail channel, slot, and/or pocket within the top surface of a handgun slide within the top surface of a handgun slide **24**. One channel runs transversely across the end of the handgun having the muzzle. Another channel runs across the opposite end of the gun **24**. In other embodiments, not shown, the sight may be installed via other methods, such as by a threaded screw.
(7) The housing for either the front sight or the rear sight may have one window, or multiple windows. The term window in this case refers to pockets that provide the sides of the middle portions of the fiber rod with lateral access to light. In one embodiment, the sight housing may feature two such windows per bore, separated by a dividing septum that also provides support for an insert within the housing. The window septum arches over the bores that pass through the sight body. In other embodiments, additional windows may be formed by additional dividing walls of the housing. This can offer the inserted piece greater protection from external impact and dirt or debris. In yet another embodiment there are no windows, for when an insert does not need to be of such nature as to transmit ambient light. This offers the greatest protection to any insert used. In the

embodiment shown in FIG. **1** the insert can be seen from the side, with at least one window utilized for either or both front and rear sights.
(8) FIG. **1** further shows that the insert is not visible from the direction facing the muzzle end of the sight housing of either front sight or rear sight. The insert is visible from the rear end of the handgun.
(9) FIG. **2** shows a single front sight housing **26** and a single fiber optic insert **30** in an exploded view of the front sight with the components as it would be disassembled. In the illustrated embodiment, there is a housing **26**, which can be made of a variety of materials, including but not limited to resins, steel, aluminum, and composites. The front sight housing has a first end **32** and a second end **34** linearly related to each other along an axis **36**. The first end faces the shooter, and the second end faces the target. Within and between these ends is a cylindrical bore **40** extending horizontally from the front surface **41** to the rear surface **43**. The bore may also be referred to as a channel, that proceeds linearly along a bore axis **36** through the entire housing, open on both ends.
(10) The first end **32** of the housing has an internal rear-facing counter-bore shoulder **42** that narrows the channel a set distance to a diameter less than that of the main bore diameter before the channel's opening **44** at the first end **32** of the housing. The second end of the housing **34** is internally threaded **52**. Part of the channel between the two ends is exposed at the top and sides, forming window **54** that exposes the fiber to ambient light. In one embodiment this opening is a single window, and in another embodiment the open portion is divided into multiple windows with a reinforcing and protective bridge at the midpoint.
(11) The channel **40** may be formed by multiple means. For example, in an embodiment where the sight housing is formed by a machining process, the channel may be bored out. In embodiments where the housing is cast, the channel may be part of the cast design. In yet other embodiments such as when 3D printed, the housing forms around the channel due to an absence of material being placed upon the layers in a collection of layers.
(12) FIG. **2** further depicts an insert **30** that is placed into the channel **40** from the second end **34** through the threaded portion **52** in a predominantly similar direction of travel as the channel when going from the second end **34** towards the first end **32**.
(13) The insert piece **30** is a cylindrical body, and may take on a variety of shapes in a predominantly uniform first width or diameter **56** and having a step-down end **60** with a second diameter **70**. This step-down end **60** forms a frustoconical tapered nose that protrudes from the main body of the insert **30** having the first diameter **56**. In this embodiment the insert piece is cylindrical first radius sized to be closely received in the sight bore and has a step-down end or nose **60** of a second radius **70** sized to be closely received in the aperture at the rear of the sight body, creating a rear-facing shoulder disc on the insert. The insert is machined, molded, or formed in some other process, such as 3D printing, to create the shoulder **62** and extension **60**.
(14) The step **62** of the insert **30** abuts the shoulder **42** of the counter-bore **50**. The nose of the insert **60** protrudes beyond the counter-bore step **42** and may be recessed within, flush with, or protruding beyond the first end of the sight housing **32**.
(15) The insert may embody multiple rear end nose surface shapes. In one embodiment, the insert **30** is a fiber optic piece having a convex surface, increasing visibility to the end user.
(16) The step-down end of the insert **60** may protrude beyond the sight's housing to provide the advantage of not having dirt or debris accumulate within the gap or a recess generated when having an insert is recessed within the housing. Alternatively, an insert may be flush with or recessed within the housing entirely. This offers protection for the insert piece from external damage or corruption. In one embodiment, the insert may be a simple cylinder free of a nose, and the rear surface abutting the shelf
(17) The insert piece is seated within the housing, having the step-down end **60** abuts the step **64** at one end of the housing with the shoulder **62** pressing against the shelf **64**, and is secured from backing out by a set screw **66** threaded into the second end **34** of the housing having a threaded

surface **52**. The set screw **66** abuts the larger forward end of the insert **30** and is out of the view of the end user, on the second end **34** facing the target. This provides safer conditions for the end user as it decreases their visibility to a potential threat from a lack of light exposure emitting from, or reflected by, the insert where it to be visible to a threatening party.

(18) The set screw **66** has a nylon thread-locking material either sprayed as a liquid or applied as a patch onto its threads to help prevent the set screw from inadvertently backing out from the recoil or vibrations it may experience. In other embodiments, a mechanical thread locking means is not used so as to allow replacement of insert pieces should they become damaged, or the user wants a different color, type, or application.

(19) The insert is captured without compressive forces, but may be firmly secured to avoid movement. The portion of the insert having the second radius **70** extends into the smaller counterbore **50** and is visible at the rear face of the sight **32**. No heat is required for securing or replacing the insert.

(20) FIG. **3** depicts a rear sight **72** comprising of a housing **74** having a first end **76** oriented towards the user of a handgun, and a second end **80** oriented towards the direction of the muzzle of the handgun. The housing is divided into a first lateral side **94** and a second, opposing lateral side **96**. Each side of the housing has a bore **81** and **82**, also called a channel, having a first diameter **84** spanning the majority of the channel from the second end **80** towards the first end **76**. Each channel has at the first end of the rear sight housing **76** a counter bore **86** of a second diameter **90** narrower than the first diameter **86**. At the second end of the housing **80** for each channel is a threaded section **91** and **92**. This arrangement for the first lateral side **94** and second lateral side **96** of the rear sight **72** is similar to that of the front sight of FIG. **2** as described in preceding paragraphs.

(21) There are two inserts **99** and **100** having the same description as in the preceding paragraphs regarding the front sight. The inserts **100** are likewise inserted into the rear sight housing **74** from the second end **80** through the bore **81** and **82** towards the first end **76** in a linear direction along a respective axis **101** and **102**. The inserts **99** and **100** have the same relationship with their corresponding rear sight counter-bore in an equivalent manner as described above for the front sight. Each rear sight insert **99** and **100** is retained by one of two corresponding set screws **103** and **104** threaded into the threaded sections **94** of the second end **74** of the rear sight **72**.

(22) FIG. **4** depicts a side view of one embodiment where the sight is fully assembled. The sight housing body **26** contains a fully seated insert **30**. The insert having a first end **112** towards a first end of the sight housing **32**, said first end of the insert **60** having a step-down end **60** comprising of a protruding portion with a diameter or cross sectional length **70** different from that of a diameter or cross sectional area **56** of the main body of the insert **30**, forming a shoulder region **62** in contact with a counter-bore step **64** of the first end of the sight housing **32**. The insert **30** is retained within the sight body **26** by a set screw **66** threaded into the second end **52** of the sight housing. FIG. **4** further depicts a protruding dovetail body **132** of the sight housing that interfaces with the slide of a firearm. The embodiment shown has room for the set screw for complete seating with no spaces between the shoulder and shelf. The insert diameters are depicted undersized with a gap from the bore, but in practice these are preferably a close slip fit without an excessive gap. To the extent there is any gap, the step and shoulder will assist in centering the insert due to a taper interface.

(23) FIG. **5** depicts an enlarged view of the shoulder-counter-bore step interaction of first-end portion of the sight depicted in FIG. **4**. The first-end **32** of the sight has a counter-bore shoulder **42** and corresponding shoulder **64** of the step-down end of the insert **60** abuts the step **62**. The step-down end **60** can protrude beyond the sight housing first end **32** or be flush with the housing. The insert diameters are depicted undersized with a gap from the bore, but in practice these are preferably a close slip fit without an excessive gap. To the extent there is any gap, the step and shoulder will assist in centering the insert due to a taper interface.

(24) The insert **30** is retained within the sight body **26** by a set screw **66** threaded into the second end **52** of the sight housing. FIG. **4** further depicts a protruding dovetail body **132** of the sight

housing that interfaces with the slide of a firearm.
(25) FIG. **5** depicts an enlarged view of the shoulder-counter-bore step interaction of first-end portion of the sight depicted in FIG. **4**. The first-end **32** of the sight has a counter-bore shoulder **42** with angle **142**, abutting the step **62** of the step-down end of the insert **60** having corresponding angle **64**. The step-down end **60** can protrude beyond the sight housing first end or be flush with the housing. The insert diameters are depicted undersized with a gap from the bore, but in practice these are preferably a close slip fit without an excessive gap. To the extent there is any gap, the step and shoulder will assist in centering the insert due to a taper interface.
(26) In an alternate embodiment, the step-down end with shoulder and the counter-bore with step is at the second end of the sight housing. That is, as opposed to a small nose with a reduced diameter, the insert takes the form of a nail with a head adjacent to the set screw. In this embodiment, the main body of the insert has a first end extending towards the first end of the sight housing as in the front sight first end **32**, and a second end that is oriented towards the second end of the sight housing as in the second end **34** of the front sight housing. However, the majority of the main body of the insert is a narrow shaft, with the second end having a larger diameter than the main body forming a step. The channel would have a first larger diameter at the sight housing's second end, such as at the set screw, and a second smaller diameter forming the majority of the length of the channel so as to accommodate the main body of the insert. The insert's larger diameter second end abuts the narrowing portion of the main bore channel having a narrower diameter. Once inserted fully where the insert's step from the second end presses against the shoulder of the bore, a set screw is threaded into the second end and secures the insert. This may be advantageous when wanting to have a front sight present a smaller dot to set between the complementary dots of the two posts of the rear sight in order to present a clearer sight picture.
(27) The insert may comprise a variety of materials. In one preferred embodiment, it may be a fiber optic piece. In another embodiment it may be comprised of brass. In yet other embodiments the insert may be of steel, aluminum, resin, composite, or Delrin.
(28) The nose **60** of the insert **30** may have a coating that provides contrast against the sight housing and the insert itself In one embodiment this coating may be a phosphorescent self-illumination material. In another it may be Teflon. In other embodiments a part of the tapered portion of the insert may be tritium.
(29) The firearm sight comprising: a body having an attachment facility configured to connect to a pistol having a forward target end and a rear end; the body having a forward end and an opposed rear end associated with the forward and rear ends of the firearm; the body defining a bore defining a forward opening and a rear opening; an elongated insert received in the bore and having a rear end and a forward end; the insert and body having an insertion limiting facility configured to admit insertion of the insert with the rear end of the insert inserted via the forward opening of the bore, and to prevent passage of the insert beyond a limited insertion amount. The insertion limiting facility includes the bore defining a step, with a greater bore width forward of the step and lesser bore width rear of the step wherein the step is proximate the rear aperture and the insertion limiting facility includes the insert defining a shoulder. The insertion limiting facility includes the body bore defining a forward-facing surface and the insert having a rear-facing surface, and forward- facing surface of the body abutting the rear facing surface of the insert. The insert is admitted to the bore only via the forward direction. The forward opening of bore is larger than the rear opening.

Claims

1. A firearm sight for a firearm defining a rear direction facing a shooter, the sight comprising: a housing having a first end facing the rear direction and a second end facing an opposite forward direction; the housing defining a channel; the channel including a stop surface facing the forward direction; an elongated insert within the channel, and having a rear end portion visible from the rear

direction; the elongated insert being optically transmissive along substantially its entire length and substantially filling the channel; the elongated insert having a limiting surface abutting the stop surface; and wherein the stop surface of the housing is proximate a rear of the housing.
2. The sight of claim 1 including a plug secured to a forward end of the bore, forward of the elongated insert to retain the elongated insert.
3. The sight of claim 2 wherein the plug is a set screw.
4. The sight of claim 2 wherein the plug obscures visibility of the elongated insert from a forward direction.
5. The sight of claim 1 with the elongated insert being retained at one end with a set screw obscuring the opening of the channel entirely at one end.
6. The sight of claim 1 wherein the elongated insert is a fiber optic element.
7. The sight of claim 1 wherein the elongated insert has a convex rear end surface.
8. The sight of claim 1 wherein the stop surface of the housing is a frustoconical tapered surface.
9. The sight of claim 1 wherein a rear portion of the elongated insert protrudes from the housing.
10. The sight of claim 1 wherein a forward end of the channel is internally threaded.
11. The sight of claim 1 wherein the elongated insert has a rear end portion narrower than a width of a forward portion of the elongated insert.
12. A firearm sight for a firearm defining a rear direction facing a shooter, the sight comprising: a housing having a first end facing the rear direction and a second end facing an opposite forward direction; the housing defining a channel; the channel including a stop surface facing the forward direction; an elongated insert within the channel, and having a rear end portion visible from the rear direction; the elongated insert being optically transmissive along substantially its entire length and substantially fills the channel; the elongated insert having a limiting surface abutting the stop surface; and wherein the elongated insert has a rear end portion narrower than a width of a forward portion of the elongated insert.
13. The sight of claim 12 including a plug secured to a forward end of the bore, forward of the elongated insert to retain the elongated insert.
14. The sight of claim 13 wherein the plug is a set screw.
15. The sight of claim 13 wherein the plug obscures visibility of the elongated insert from a forward direction.
16. The sight of claim 12 with the elongated insert being retained at one end with a set screw obscuring the opening of the channel entirely at one end.
17. The sight of claim 12 wherein the elongated insert is a fiber optic element.
18. The sight of claim 12 wherein the elongated insert has a convex rear end surface.
19. The sight of claim 12 wherein the stop surface of the housing is a frustoconical tapered surface.
20. The sight of claim 12 wherein a rear portion of the elongated insert protrudes from the housing.
21. The sight of claim 12 wherein a forward end of the channel is internally threaded.