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GAS TORCH

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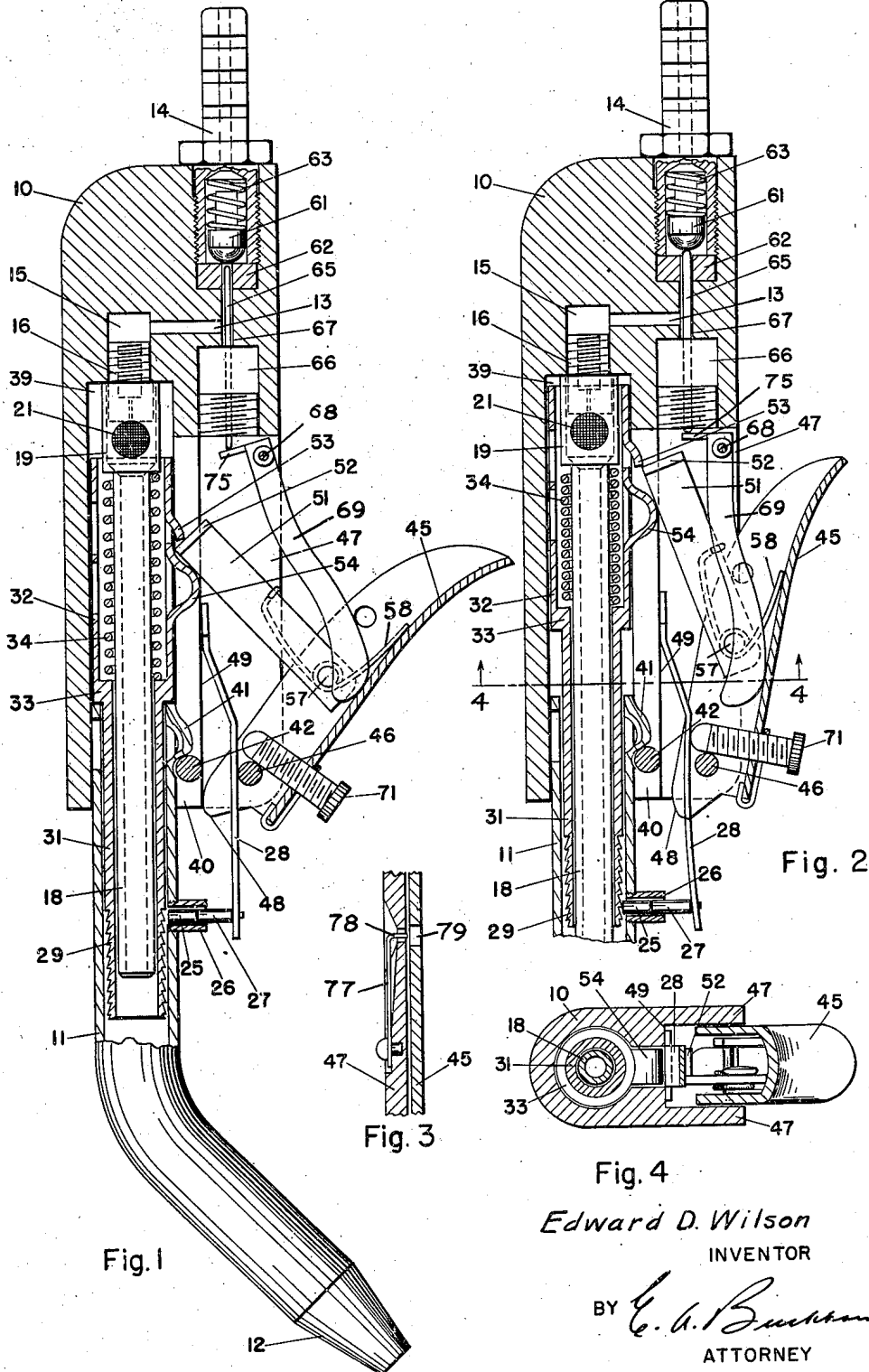


Fig. 4  
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# UNITED STATES PATENT OFFICE

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## GAS TORCH

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6 Claims. (Cl. 67—20.1)

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The present invention relates to gas torches and more particularly to the type used for soldering, light brazing and having built-in igniter means.

In my prior Patent No. 2,232,893, issued February 25, 1941, is disclosed an igniter torch of the type referred to and it is an object of the present invention to provide certain improvements over the structure of my earlier invention.

More specifically it is an object of the present invention to provide a new and improved gas torch of the type described which is more compact and easier to operate than those which have been provided heretofore.

A still further object of the present invention is to provide a new and improved torch of the class described having a new and improved igniter arrangement incorporated therein.

Another object of the present invention is to provide a gas torch of the type referred to having a new and improved igniter operating mechanism.

A further object is to provide a new and improved control valve and operating arrangement in a torch of the class described.

These and other objects of the present invention will appear from the following description taken in connection with the accompanying drawing while the features of novelty will be pointed out with greater particularity in the appended claims.

In the drawing Fig. 1 is a longitudinal sectional view of a gas torch constructed in accordance with one form of the present invention; Fig. 2 is a longitudinal sectional view of the torch with the parts illustrated in a second position of adjustment; Fig. 3 is a fragmentary sectional view illustrating one detail of the invention; and Fig. 4 is a cross-sectional view taken along the line 4—4 of Fig. 2.

Referring now to the drawing, the gas torch comprises a handle 10 having a flame tube 11 mounted in one end thereof and provided with a tip 12. A passage 13 for inflammable gas is provided through the handle 10 and to which gas is supplied through the hose connection fitting 14. The passage 13 communicates with the enlarged bore 15 within which is threaded the jet unit 16. A hollow cylindrical stem 18 is provided with an enlarged cylindrical end portion 19 which is loosely fitted over the end of the jet unit 16, the cylindrical portion 19 being provided with a plurality of openings 21 for admitting air for mixing with the gas discharged through the jet into the stem 18. A protective

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screen is preferably provided around the inside surface of the cylindrical stem portion 19 for covering the openings 21 so as to prevent flashback therethrough as the torch is extinguished.

The outer end of the stem portion 18 projects into the end of the flame tube mounted in the handle 10 and defines a continuation of the gas passage through the torch between the inlet 14 and the flame tube.

A friction ignition means is incorporated into the gas torch and is comprised of a flint element and a cooperating abrasive element together with means for causing relative movement therebetween whereby sparks may be generated and directed into the gas flow for igniting the same.

As illustrated, the flint element 25 is mounted for longitudinal movement within a cylindrical holder 26 mounted in the lower side wall of the flame tube 11 adjacent the end of the handle 10.

The flint 25 is adapted to be engaged by the end of a pin 27 mounted upon the end of a resilient spring arm 28 for projecting the flint into the flame tube and into engagement with the cooperating abrasive end portion 29 of the tubular member 31.

The tubular member 31 surrounds the stem 18 and is freely movable thereabout longitudinally of the torch. The tubular member 31 is provided with an enlarged cylindrical end portion 32 defining a shoulder 33 which is adapted to engage with the inner end of the flame tube 11.

The tubular member 31 is normally biased to a first limit position in the direction toward the flame tube by means of a spring 34 arranged between a shoulder on the inside of the enlarged portion 32 opposite the shoulder 33 and the shoulder defined by the enlarged portion 19 on the end of the stem 18.

In the first limit position as shown the shoulder 33 is held in engagement with the end of the flame tube 11 by the spring 34.

The handle 10 is provided with a longitudinal cylindrical bore of only a slightly larger diameter than the diameter of the flame tube 11 so that the end of the flame tube will fit relatively snugly therein. The enlarged portion 32 of the tubular member 31 is of sufficiently smaller outside diameter than the diameter of the aforementioned bore in order that the tubular member may slide freely longitudinally therein. The bore in the handle is slotted lengthwise from the front end of the handle as indicated at 40, the width of the slot 40 being substantially less than the diameter of the bore. The end of the flame tube 11 is provided with a downwardly struck out portion 41 having a width slightly less than

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the width of the slot 40 and is held between the opposite side walls of the slot in a predetermined angular relation within the bore so that rotation of the flame tube within the handle is precluded thereby. A screw 42 extending transversely of the handle forwardly of the struck out portion 41 removably secures the flame tube in proper position within the end of the handle.

Lever means are provided in the gas torch and which is operatively connected to the tubular member 31 for shifting the member longitudinally of the handle within the bore 39 to a second limit position away from the flame tube 11. The lever means in this instance comprises a trigger 45 which is U-shape in cross-section and which is pivotally mounted by means of the pin 46 between the flanges 47 of the handle 10. The rear end of the trigger 45 is provided with extensions 48 which are adapted to engage with the shoulders 49 on opposite sides of the slot 40 for limiting the pivotal movement of the outer end of the trigger 45 away from the handle. A link 51 is pivotally connected as at 57 to the trigger 45 and is biased in the counterclockwise direction as viewed in Fig. 1 by means of the spring 58. The opposite end of the link 51 is provided with a right angularly offset portion 52 which is adapted to engage against the edge of the struck out portion 53 of the tubular member 31.

As the outer end of the trigger 45 is pressed toward the handle 10, as shown in Fig. 2, the link 51 bearing against the stop 53 will force the tubular member 31 longitudinally within the bore 39 toward the second limit position in the end of the handle. The tubular member 31 is provided with a second struck out portion 54 which is adapted to bear against the adjacent edge of the link 51 and to effect disengagement of the right angular portion 52 from the stop 53 as the tubular member is moved to the second limit position away from the flame tube 11. Immediately upon release of the link 51 from the stop 53 the spring 34 will return the tubular member 31 to the first limit position with a rapid movement. The struck out portions 53 and 54 of the tubular member 31 extend within the slot 40 thereby preventing rotational movement of the tubular member 31 and guiding the longitudinal movement thereof. Similarly, the end portion 52 of the link 51 travels within the slot 41. Due to the fact that the space surrounding the abrasive portion 29 of the opposite end of the tubular member 31 communicated with the gas passage through the flame tube 11 sparks generated from the flint 25 will be directed forwardly into the flame tube to ignite the flow of gas passing therethrough.

A valve 61 is mounted in the end of the fitting 14 threaded into the end of the handle 10 and is urged to a closed position over the opening in the hardened seat 62 by spring 63. The valve 61 is adapted to be moved to the opened condition by means of the push rod 65 extending through the packed bushing 66 and through the passage portion 67. The openings in the valve seat 62 and the passage portion 67 are somewhat larger than the diameter of the push rod 65 in order that gas may flow around the push rod when the valve 61 is moved to the opened position as illustrated in the view of Fig. 2. Pivotaly mounted as at 68 between the flanges 47 of the handle is a crank arm 69, the curved outer end portion of which is adapted to engage against the inner surface of the trigger 45 along-

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side the link 51. The opposite end 75 of the crank arm is adapted to engage the end of the push rod 65 to move the valve 61 to the opened position when the trigger is depressed. Since the valve 61 is normally biased to the closed position it is necessary that the trigger 45 be held in the depressed position in order to maintain the flow of gas to the flame tube. For holding the trigger 45 in the depressed position a suitable latch means is provided and which is illustrated more clearly in the view of Fig. 3. This mechanism consists of a leaf spring 77 secured in an elongated recess provided in the outer surface of one of the flanges 47. The free end 78 of the spring is bent inwardly and extends through a cooperating hole at the end of the recess. An opening 79 is provided in the adjacent side flange of the trigger 45 and when the trigger 45 is depressed the end of the spring 77 may be pushed in with the thumb to extend the spring end portion into the opening 79 of the trigger. The pressure on the trigger may then be released and the outward thrust of the trigger due to valve spring 53 and the spring 58 will hold the latch spring 77 in the latching position. The latch spring is released simply by pressing the trigger slightly inwardly without also holding in the latch spring 77.

It will be observed that, as the trigger 45 is depressed for igniting the torch, the air openings 21 are substantially closed by the adjacent end of the tubular member 32, as shown in Fig. 2, whereby an enriched mixture of gas is fed through the stem 18 for facilitating the ignition thereof. Upon disengagement of the link portion 52 from the struck out portion or catch 53 and return of the tubular member to the first limit position, the openings 21 are uncovered for admitting an increased amount of air for proper burning at the torch tip.

In order to minimize the wear on the flint 25 of the igniter the spring 28 is so designed as to exert little or no force against the flint during the period in which the tubular member 31 is moved from the position shown in Fig. 1 to the cocked position shown in Fig. 2. Threadedly mounted in the trigger 45 is a screw 71 the end of which is adapted to engage with the spring 28 just prior to the movement of the tubular member 31 by the trigger to the second limit position and release thereof for return to the forward position. Upon engagement of the end of the screw 71 with the spring 28 a pressure will be exerted through the pin 27 against the flint 25 to urge the flint with considerable force against the abrasive surface portion 29 of the tubular member and which pressure is maintained throughout the return movement of the tubular member. This is an important feature of the invention and results substantially in doubling the life of the flint as compared with an arrangement in which the flint would be held in tightened engagement with the abrasive surface during the movement of the tubular member in both directions of travel.

While I have described the invention in what is considered to be a preferred embodiment it is desired that it be understood that the specific details shown are merely illustrative and that the invention may be carried out by other means.

What I claim is:

1. In a gas torch including a handle, a passage for inflammable gas through said handle, a flame tube removably secured to one end of said handle, a tubular member arranged for longitudinal-

ly sliding movement within said handle and having a reduced diameter portion extending into said flame tube, an external shoulder on said member defining a stop for engaging with the end of said flame tube, spring means within said handle bearing against said member for urging said shoulder against said flame tube, friction ignition means comprising a flint mounted in a side wall of said flame tube and an abrasive portion on the end of said tubular member, the combination comprising a lever pivotally mounted on said handle, a link pivotally mounted at one end on said handle, the other end of said link being adapted to loosely engage with said tubular member for moving said tubular member to a second limit position against the bias of said spring, a projection on said tubular member for engaging said link for effecting disengagement of said link from said tubular member upon movement of said tubular member to said second limit position, said spring being operative upon release of said link to rapidly move said tubular member toward said flame tube whereby sparks are generated between said flint and said abrasive portion for igniting gas flowing through said passage.

2. A gas torch, a passage for inflammable gas through said torch, friction ignition means mounted within said torch adjacent said passage, said friction ignition means comprising cooperating flint and abrasive elements, one of said elements being mounted for movement relative to the other, spring means for urging said movable element to a first limit position, lever means for moving said movable element to a second limit position, said movable element being adapted to be rapidly returned to said first limit position by said spring, and means operative by said lever means for exerting a pressure between said flint and abrasive elements during the return movement of said movable element.

3. A gas torch, a passage for inflammable gas through said torch, friction ignition means mounted adjacent said handle, said friction ignition means comprising cooperating flint and abrasive elements, the space between said elements communicating with said passage, one of said elements being mounted for movement relative to the other, spring means urging said movable element to a first limit position, lever means for moving said movable element to a second limit position away from said first limit position, means for automatically effecting disconnection of said lever means from said movable element upon movement thereof to said second limit position, and a leaf spring engageable by said lever and operative upon movement of said lever to the position corresponding to the second limit position of said movable element for applying pressure to said flint to urge said flint into frictional engagement with said abrasive element during return movement of said movable element.

4. A gas torch having means defining a passage for inflammable gas therethrough, a jet within said passage, friction ignition means comprising relatively movable flint and abrasive supporting elements, one of said elements being mounted for movement relative to the other longitudinally of said passage, an air opening in said passage defining means communicating with said passage between said jet and said ignition means, spring means urging said movable element toward a first limit position, lever means for moving said movable element to a second limit position in the

opposite direction from said first position, means for effecting disconnection of said lever means from said movable element upon movement thereof to said second limit position, closure means for said opening operably associated with said movable element and operable therewith for substantially closing said air opening upon movement of said movable element to said second position, said movable element upon release from said lever means being rapidly returned by said spring toward said first limit position to effect generation of sparks by said ignition means for igniting gas flowing through said passage, and for re-opening said air opening.

5. A gas torch, means defining a passage through said torch for inflammable gas, a jet in said passage, friction ignition means comprising relatively movable flint and abrasive supporting elements mounted adjacent said passage, an air opening in said passage defining means communicating with said passage between said jet and said ignition means, spring means urging said movable element to a first limit position, lever means for moving said movable element to a second limit position away from said first limit position, means for effecting release of said movable element from said lever means upon movement of said movable element to said second limit position for effecting generation of sparks by said ignition means by movement of said movable element from said second position to said first position, and closure means means operably associated with said movable element for effecting closure of said air opening upon movement of said movable element to said second position.

6. A gas torch comprising a handle, an inlet passage for inflammable gas in said handle, a jet at the end of said passage, tubular means extending from said jet, an air inlet opening through the wall of said tubular means adjacent said jet, a member telescopically slidable over said tubular means, a spring in said handle biasing said member toward a first limit position, a lever pivoted on said handle for moving said member to a second limit position against the bias of said spring, an element for releasably connecting said lever to said member, means for automatically effecting disconnection of said element between said lever and said member upon movement of said member by said lever to said second limit position, friction ignition means comprising relatively movable flint and abrasive means, one of said last mentioned means being provided on said member, the other of said last mentioned means being fixedly mounted with respect to said handle.

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