April 15, 1952 W. J. GRANFIELD 2,593,295

SWEATING TORCH FOR CONDUITS

Filed Dec. 7, 1949

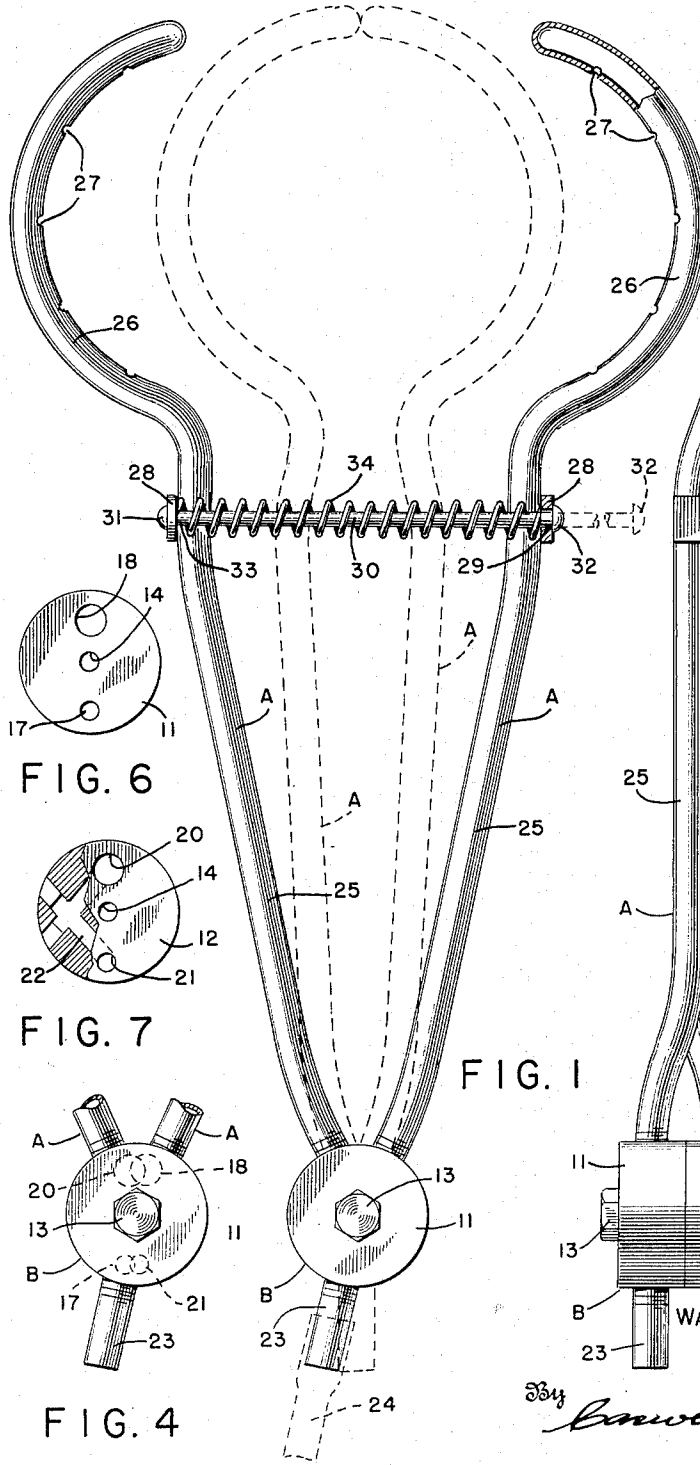


FIG. 1

FIG. 6

FIG. 7

FIG. 4

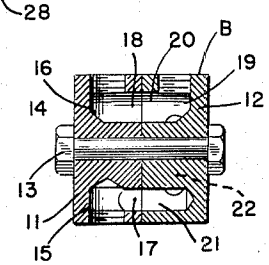


FIG. 5

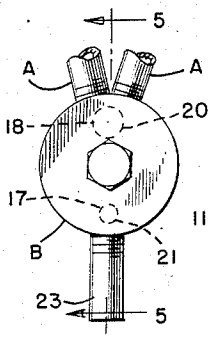


FIG. 3

Inventor

WALTER JAMES GRANFIELD

By Banwell & Lagaard

Patented Apr. 15, 1952

2,593,295

UNITED STATES PATENT OFFICE

2,593,295

SWEATING TORCH FOR CONDUITS

Walter James Granfield, Minneapolis, Minn.

Application December 7, 1949, Serial No. 131,543

4 Claims. (Cl. 158—99)

1

My invention relates to improvements in sweating torches and particularly torches of the gas-burning type for sweating conduit sections together.

The invention contemplates the employment of a pair of tubular arms hinged together at the butts thereof through the medium of a hinge member comprising a pair of pivotally connected hinge-blocks. Each arm has an intermediate handle portion and a curved tip portion formed with burner orifices along the concave side thereof. The handle portions of the arms are substantially axially coplanar and are gripped in one hand of the user in manipulating the tool. A spring spreads the arms apart relatively disposing the tip portions thereof so that they may straddle a conduit. The curved tip portions of the arms occupy a common plane with their concave sides facing each other and they provide a ring-like burner encircling the straddled conduit when the handle portions of the arms are brought together in the grip of the user's hand.

A feature of the invention resides in supplying gas to the arms through the hinge-blocks of the hinge member and in such manner that when the arms are spread apart the supply of gas reaching the burner orifices through the arms is in relatively lesser volume than when said arms are swung together to bring the curved tip portions thereof into conduit encircling relationship.

Another feature of the invention resides in axially disposing the tip portions of the arms in a plane at an angle relative to the plane of the handle portions of said arms so that the user's hand will be unobstructed by wall, ceiling, floor or other obstruction in the operative relationship of the burner-forming tip portions of said arms.

A further feature of the invention resides in the interpositioning of a helical expansion spring between abutment members on the arms for spreading said arms apart, and in the employment of a stop member for limiting the spreading of the arms, the stop member being carried by said abutments and disposed axially of said spring.

In the accompanying drawings, Fig. 1 is a view of a sweating torch constructed in accordance with my invention, said view showing said torch broadside from the back thereof;

Fig. 2 is an edgewise view of said torch structure;

Fig. 3 is a fragmentary view showing the hinge member of said structure, as seen in Fig. 1, together with portions of the arms and inlet nipple extending therefrom, the relative positions of said arms corresponding with the position thereof shown in dotted lines in said Fig. 1;

2

Fig. 4 is a view similar to Fig. 3, the relative position of the arms corresponding with the positions thereof shown in solid lines in said Fig. 1;

Fig. 5 is a sectional view in detail of the hinge member, said view being taken as on the line 5—5 of Fig. 3;

Fig. 6 is a detail view of one of the hinge-blocks of said hinge member showing the inner face of said hinge-block, and

Fig. 7 is a detail view of the other hinge-block showing the inner face thereof, said view being broken away to reveal the gas passageway in said second hinge-block.

Referring to the drawings, it will be seen that the illustrated form of my invention includes a pair of arms A and a hinge member B consisting of two cylindrical hinge-blocks 11, 12 which are pivoted together by means of a bolt 13 extending through axial bores 14 therein. The inner faces of said hinge-blocks 11, 12 turn one against the other. The hinge-block 11 has diametrically opposed radial bores therein providing a gas inlet opening 15 and a gas outlet opening 16. A port 17 opening at the inner face of said hinge-block 11 communicates with said inlet opening 15 and a port 18 also opening at the inner face of said first hinge-block 11 communicates with said outlet opening 16. The second hinge-block 12 has a radial bore therein providing a gas outlet opening 19 with which a port 20 in said second hinge-block 12 communicates. This port 20 in said second hinge-block 12 opens at the inner face thereof and confronts the port 18 in the first hinge-block 11. Similarly a port 21 in said second hinge-block opens at the inner face thereof and confronts the port 17 in said first hinge-block 11. The ports 21, 20 in the second hinge-block 12 are interconnected by means of a passageway 22 formed in said second hinge-block 12.

A feed nipple 23 adapted to be connected with a hose 24 leading to a source of gas supply is threaded into the bore forming the inlet opening 15 in said first hinge-block 11.

The arms A are tubular, the butt of one thereof being threaded into the bore forming the gas outlet opening 16 in the first hinge-block 11, the butt of the second arm 10 being threaded into the bore forming the gas outlet opening 19 in the second hinge-block 12. Said arms A intermediately thereof are straight and axially coplanar to provide handle portions 25 which are adapted to be

grasped in one hand of the user, who, with such hand, conveniently handles the tool. The tip portions 26 of said arms A are semi-circularly curved and axially occupy a common plane with their concave sides facing each other. These tip portions 26 of the tubular arms A are closed at their outer extremities and are formed along their facing sides with openings providing gas orifices 27. Secured to each arm A between the handle portion 25 and tip portion 26 thereof is an ear-like abutment 28 formed with an aperture 29 therein. A stop-rod 30, having heads 31, 32 at the opposite ends thereof, extends through the apertures 29 in the abutments 28. Preferably, said stop-rod 30 will be secured at one end thereof to one of the abutments 28, as at 33, while being slidable in the aperture 29 of the other abutment 28. Encircling the stop-rod 30 is a helical expansion spring 34 which bears at its ends against the abutments 28 on said arms A. This spring 34 acts normally to spread the arms A, spacing apart the extremities of their tip portions 26 and enabling them to straddle a conduit to be heated. As the spring 34 expands and spreads the arms A to their predetermined limit, the head 32 on the stop-rod 30 will engage its respective abutment 28 and arrest the spreading of said arms A by the action of said spring 34.

Gas admitted to the torch through the feed nipple 23 enters the hinge member B passing through the inlet opening 15 and port 17 of the hinge-block 11. Thence, the gas passes through the port 21 and passageway 22 in the hinge-block 12 to the outlet opening 19 therein from which a portion of the gas enters the tubular arm A threaded into said outlet opening 19. Another portion of the gas passes from said opening 19 through the port 20 in the hinge-block 12 to the port 18 in the hinge-block 11 and thence through the outlet opening 16 in said hinge-block 11 to the interior of the tubular arm A threaded into said outlet opening 16. Entering the tubular arms A, the gas passes therealong finally exiting radially inward from the curved tip portions 26 thereof through the gas orifices 27 therein. This exiting gas is lighted in preparing the torch for use.

Holding the lighted torch in one hand grasped about the handle portions 25 of the arms A, the user manipulates the tool to cause the spring-spread tip portions 26 of said arms A to straddle a conduit to be heat-treated, whereupon he tightens his grip to bring the arms A together, as shown in dotted lines in Fig. 1, thereby to cause said curved tip portions 26 of the arms A to encircle such conduit and bring the jets of flame from the burner orifices 27 against such conduit from all sides thereof.

Having accomplished the desired heating of the conduit with the torch, the user's grip on the handle portions 25 of the arms A is lightened to release them to the action of the spring 34 which spreads said arms A apart to the limit permitted by the stop-rod 30. Thereupon, the tip portions 26 of the arms A will clear the conduit previously encircled by them and the tool will be removed from said conduit.

When the arms A of the torch are brought together into operative relationship (dotted lines, Fig. 1, solid lines, Fig. 3), the confronting ports 17, 21 of the hinge-blocks 11, 12 register fully with each other allowing the gas to flow in maximum quantity to the burner orifices 27 in the arms A, thereby producing jets of flame of a size

to accomplish the required heating of the conduit to be treated. However, it is to be noted that when the arms A are spread apart (solid lines, Figs. 1 and 4) and thus disposed in inoperative relationship said confronting ports 17, 21 of said hinge-blocks 11, 12 register only partially with the result that the flow of gas to the orifices 27 is relatively restricted. This restricted flow of gas to said burner orifices 27, while insufficient to produce jets of flame of a size capable of heating a conduit for the sweating thereof, is sufficient to maintain small pilot flames. The tip or burner portions of the arms A, therefore, remain economically lighted between operations of the tool and the user is relieved of the task of closing the gas line 24 to the nipple 23 at the completion of one sweating operation and opening said gas line and relighting the gas at the orifices 27 at the beginning of the next operation.

The axes of the tip portions 25 of the arms A lie in a common plane which is at angle relative to the plane of the handle portions 25 of said arms A. This angularity of the tip portions 26 and handle portions 25 of the arms A enables the former to be operatively disposed about a conduit in position closely paralleling a wall, floor, ceiling or other structure while the handle portions 25 of said arms are sufficiently spaced from such structure to admit of a convenient grip of the hand about them.

Changes in the specific form of my invention, as herein described, may be made within the scope of what is claimed without departing from the spirit of my invention.

Having described my invention, what I claim as new and desire to protect by Letters Patent is:

1. In a sweating torch for conduits, a pair of tubular arms hinged together at the butts thereof, each arm having an intermediate handle portion and a curved tip portion formed with gas outlets along the concave side thereof, means for feeding gas into said tubular arms, an abutment member on each arm between the handle portion and tip portion thereof, a helical expansion spring interposed between said abutment members and acting yieldingly to swing the arms away from each other and hold them spread apart, a stop rod having connections at its opposite end portions with said abutment members, at least one of said connections slidably connecting its respective end portion of said rod with its respective abutment, said stop rod serving to limit the spreading of said arms, said stop rod being encircled by said spring and providing a mounting therefor, the handle portions of said arms being adapted to be gripped in the hand of a user and brought toward each other to swing the arms together, said tip portions of said arms being adapted to straddle a conduit when the arms are swung apart and adapted when the arms are swung together to form a ring-like burner encircling the straddled conduit.

2. In a sweating torch for conduits, a hinge member consisting of a pair of hinge-blocks pivoted together and formed with gas passageways therein, one hinge-block having a gas inlet and each thereof having a gas outlet, a pair of tubular arms, one for each hinge-block, each arm being rigidly connected at the butt thereof with its respective hinge-block and interiorly communicating with the gas outlet therein, each arm having an intermediate handle portion and a curved tip portion formed with gas outlets along the concave side thereof, means acting yieldingly to swing the arms away from each other and

hold them spread apart, the handle portions of said arms being adapted to be gripped in the hand of a user and brought toward each other to swing the arms together, said tip portions of said arms being adapted to straddle a conduit when the arms are swung apart and adapted when the arms are swung together to form a ring-like burner encircling the straddled conduit, the gas passageways in said hinge-blocks bringing the gas inlet of the one hinge-block into communication with the gas outlets of both hinge-blocks and cooperating relatively to restrict the flow of gas therethrough when the arms are spread apart.

3. In a sweating torch for conduits, a hinge member having a gas passageway therein, said hinge member consisting of a pair of hinge-blocks pivoted together, one hinge-block having a gas inlet communicating with said gas passageway and each hinge-block having a gas outlet communicating with said gas passageway, a pair of tubular arms, one for each hinge-block, each arm being connected at the butt portion thereof to its respective hinge-block and communicating interiorly of such butt portion with the gas outlet of such hinge-block, each arm having an intermediate handle portion and a curved tip portion formed with gas outlets along the concave side thereof, means acting yieldingly to swing the arms away from each other and hold them spread apart, the handle portions of said arms being adapted to be gripped in one hand of a user and brought toward each other to swing the arms together, said tip portions of said arms being adapted to straddle a conduit when the arms are swung apart and adapted when the arms are swung together to form a ring-like burner encircling the straddled conduit.

4. In a sweating torch for conduits, a pair of hinge elements pivoted together, a pair of tubular arms, one for each hinge element, each arm being

connected at the butt portion thereof to its respective hinge element and having an intermediate handle portion and a curved tip portion formed with gas outlets along the concave side thereof, each of said hinge elements having a passageway therein for the reception of gas from a source of supply, said passageway communicating with the interior of the butt portion of its respective arm, means acting yieldingly to swing the arms away from each other and hold them spread apart, the handle portions of said arms being substantially axially coplanar and adapted to be gripped in one hand of a user and brought toward each other to swing the arms together, said tip portions of said arms axially occupying a common plane angularly of the plane of said handle portions and being adapted to straddle a conduit when the arms are spread apart and adapted when the arms are swung together to form a ring-like burner encircling the straddled conduit.

WALTER JAMES GRANFIELD.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
479,686	Weiller	July 26, 1892
2,214,031	Rockefeller	Sept. 10, 1940
2,290,283	Jones	July 21, 1942
2,378,001	Drummond	June 12, 1945
2,492,526	Geibig	Dec. 27, 1949

FOREIGN PATENTS

Number	Country	Date
354,591	Italy	Nov. 29, 1937