

APPLICATION FILED JULY 29, 1912.

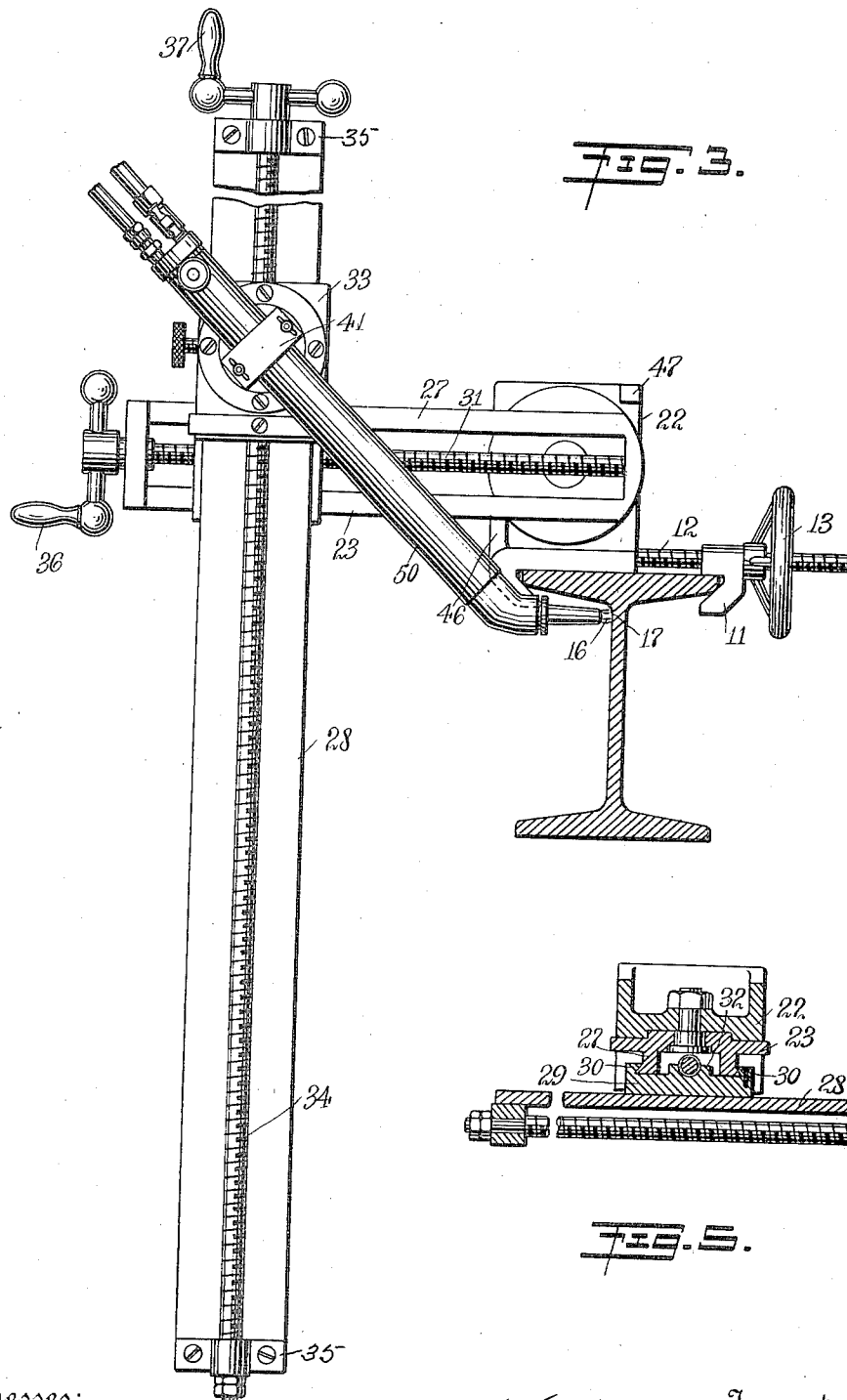
Patented Jan. 28, 1913.

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By his Attorney *[Signature]*

1,051,547.

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BLOWPIPE APPARATUS.
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3 SHEETS—SHEET 2.



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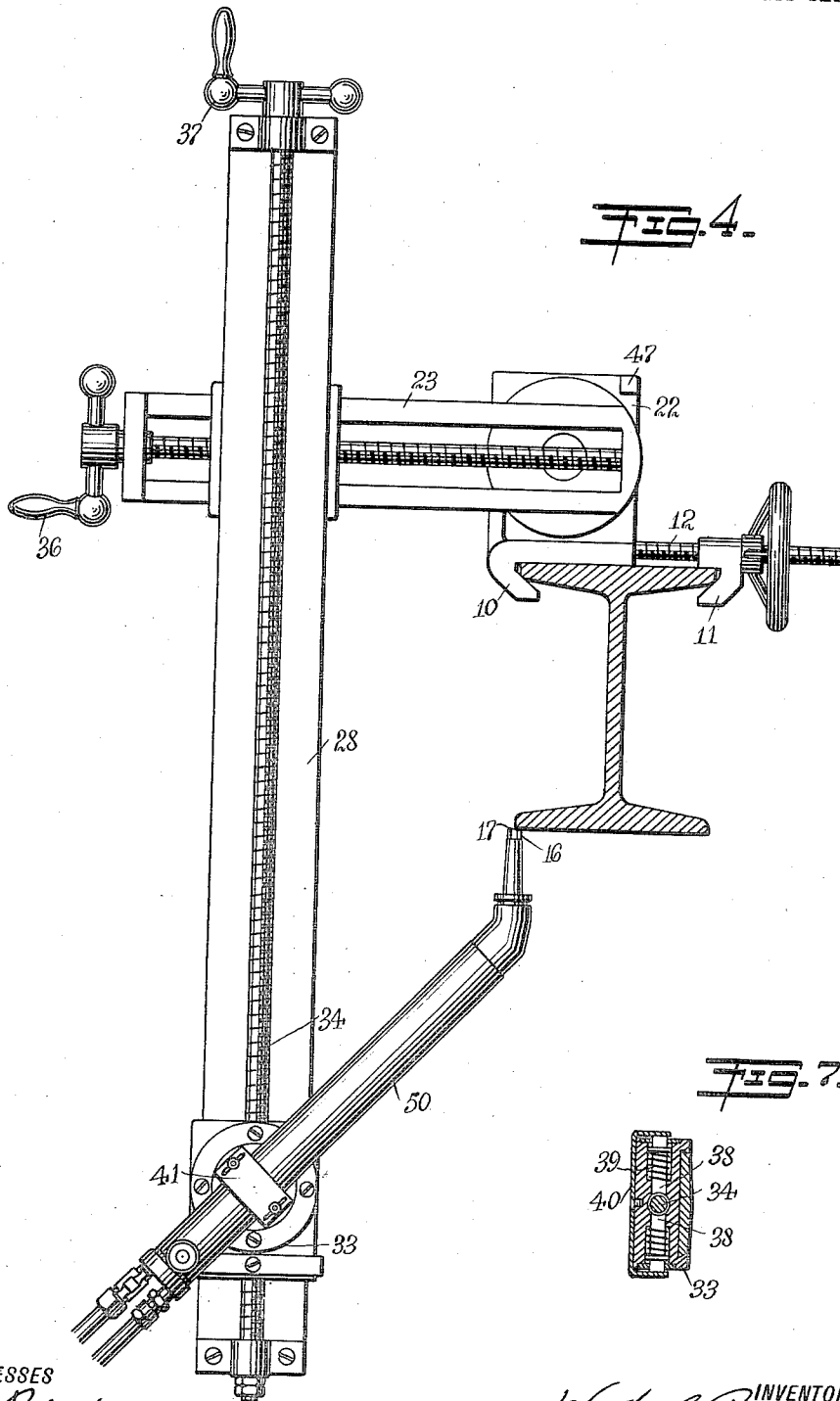


FIG. 4.

FIG. 7.

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BLOWPIPE APPARATUS.

1,051,547.

Specification of Letters Patent.

Patented Jan. 28, 1913.

Application filed July 29, 1912. Serial No. 712,038.

To all whom it may concern:

Be it known that I, WORTHY C. BUCKNAM, a citizen of the United States, and a resident of Marion, Jersey City, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Blowpipe Apparatus, of which the following is a specification.

This invention relates to means for supporting and rectilinearly moving the jets of oxy-acetylene or oxy-hydrogen blow-pipe apparatus, or torches as they are commonly called, and is designed more especially for cutting, which, as is well known, is performed with a combination of heating and oxidizing agents, such as a jet of oxygen accompanied or preceded by an ignited jet or jets of a combustible mixture, for example, oxygen and acetylene.

The object of the invention is to provide a simple apparatus whereby beams, rails or other bars may be cut conveniently, expeditiously and cleanly.

The device comprises a support to be clamped to a beam, rail or bar, suitable jet-delivering means, and guiding and propelling mechanism whereby the jets are caused to travel at uniform speed across the bar, and it also includes provisions whereby the jets may be moved across different sides of the bar in succession, without changing the position of the clamp.

In the accompanying drawings illustrating the invention by means of the preferred embodiment thereof: Figure 1 is a side elevation of the device; Fig. 2 is a vertical section therethrough; Fig. 3 is a side elevation showing the parts in changed position; Fig. 4 is a side elevation showing the parts in another position; Fig. 5 is a detail sectional view; Fig. 6 is an elevational detail; and Fig. 7 is detail sectional view.

The device is supported on a beam, rail or other bar by means of a clamp, comprising suitable jaws 10, 11 adapted to clamp on opposite edges or flanges of the bar or beam or opposite sides of the ball of a rail, a screw 12 secured to the jaw 10 and a hand wheel 13 with internal threads engaging those of the screw to advance the jaw 11. The clamp is shown applied to the top flanges of an I-beam.

The jet-delivering means may be of various suitable forms. Preferably a torch such as 50 having a straight elongated body is

employed. This body contains suitable conduits for leading the gases and is provided at the end with a suitable tip or nozzle through which the gases pass and are delivered in the form of two or more jets upon the work. The heating jet, composed preferably of oxygen and acetylene is indicated at 16, and the cutting jet of oxygen alone is indicated at 17. It will be understood that the heating jet is a flame while the cutting jet is of course invisible. The internal construction of the torch with its conduits, valves, and mixing provisions, may be of any suitable or known character.

The torch has not been illustrated in detail, but it may be substantially like that shown in my application filed May 4, 1912, Serial No. 695,289. At the rear end it is provided with suitable connections, such as 14, 15 for the attachment of flexible pipes leading from the sources of supply. There may be two of these connections or three, according to whether one supply of oxygen is led into the torch and there divided, part going to the heating jet and part to the cutting jet, or whether two separate supplies of oxygen for the two kinds of jet are provided. The heating jet, as usual, precedes the oxidizing jet in the travel along the line of the cut.

The preferred construction of the guiding and propelling mechanism whereby the jet-delivering means or torch is caused to move across or around the beam or rail will now be briefly described. The jaw 10 has a wall 22 integral with it, arranged crosswise of the rail or beam and projecting upward or away from it. On this wall is swiveled or pivoted a member or arm 23. To this end, the wall 22 is shown provided with a circular depression 24 which receives a circular projection 25 on the side and near the end of the member 23, and a suitable pivot 26 is shown connecting the two. The member 23 constitutes a guide, which by virtue of the swivel connection, is angularly movable on the clamp or support. It is shown as being formed with laterally spaced guide bars 27, the outer sides of which are undercut. There is a second guide structure at right angles to the first and movable sidewise thereon; and it is shown as comprising a beam 28, having or being attached to a suitable carriage 29 mounted on and movable along the guide arm 23. The said

carriage has suitable flanges 30 engaging the undercut side edges of the bars 27, and one of these flanges is preferably separate and secured to the carriage, so that the latter may be applied to and removed from the primary guide sidewise instead of over the end. The second guide 28 is propelled sidewise along the first guide 23 by means of a screw 31, journaled at its ends in the ends of the arm 23 and engaging a threaded or nut portion 32 on the carriage 29. This threaded part of the carriage is preferably in the nature of a half-nut, in order to enable the carriage to be applied to and removed from the primary guide in the manner described. A suitable carriage 33 is movable along the second guide 28. It is shown as provided with an undercut channel at the back which engages the undercut side edges of the guide bar. This carriage is propelled along its guide by a screw 34, journaled at its ends in bearing brackets 35 secured to the ends of the guide. The two screws are shown as provided with crank handles 36, 37, whereby they may be operated manually. The gearing shown constitutes suitable mechanical means for propelling the jet-delivering means at uniform speed, which is essential to successful cutting.

Quick release means may be provided for disconnecting either or both of the carriages 29, 33 from their screws. Such means is illustrated in connection with the carriage 33. Here the screw 34 passes through the carriage and engages two opposite nut pieces 38, which are slidable in recesses in the carriage into and out of engagement with the screw. They are urged away from the screw by springs 39 and are moved into engagement therewith by a centrally pivoted, manually-operable lever 40, having bent ends which ride over the beveled outer ends of the nut pieces, so as to force the latter inward. The carriage 33 carries the jet-delivering means or torch, and the latter is angularly adjustable on the carriage about an axis parallel to the axis of the pivot 26. To this end a suitable holder 41, in the nature of a split clamping collar to receive the body of the torch, is formed on or secured to the face of a circular plate 42 which is rotatable on the face of said carriage. Its edge is shown beveled and engaged by a retaining and bearing ring 43 secured to the carriage. The holder may be held at any angular adjustment by a plunger 44 movable in a bore in the carriage and adapted to be forced into frictional holding relation with the back wall of the plate 42 by a hand screw 45.

Suitable means are provided for holding the compound guiding and propelling mechanism against movement on the pivot 26 at either of the positions to which it may be

moved, and for limiting it to a movement of 90°, that is to say from the position shown in Fig. 1 to that of Fig. 3. Stops 46, 47 on the wall 22 positioned to be contacted by the opposite sides or edges of the member 23 limit the movements in opposite directions. The mechanism is held at either position by the nut 48 on the pivot bolt 26, the same being provided with a handle 48* for quick operation.

It will be observed that the torch 50 in effect constitutes a third arm carrying jet orifices at its end. This arm is angular, which in the present instance is achieved by setting the tip 19 at an angle to the body 14, preferably a 45° angle, and as already described it is angularly adjustable on the carriage 33. Thus, without swinging the compound guiding structure about the pivot 26, the jets may be caused to travel across one side and then another of the bar or beam, by means of the two propelling mechanisms and the angular adjustability of the torch arm (see Figs. 3 and 4). The operation will now be briefly described. In setting up the device, it is preferably, though not necessarily, attached to the top flange of an I-beam or to the ball of a rail. The torch is inserted in the holder 41 and there clamped, the heating jet orifice being in advance of the cutting jet orifice. The holder is angularly adjusted so that the jet passages are approximately perpendicular to the top of the rail or beam. The guide 28, now horizontal, is adjusted up or down to the proper height, the torch being projected through the holder to the proper distance. The carriage 33 is moved along the guide 28 to the starting position, in this instance at the right hand side of the beam. The handle 37 is then turned to propel the jet-delivering means at uniform, comparatively slow speed across the top of the beam or rail. Before this was done, the jets were, of course, turned on and the heating jet lighted. The result of this first operation is to cut through the top of the beam or rail. The whole guiding structure is now turned through an arc of 90°, the nut 48 first being released, and again tightened when the guide 28 is vertical. In this movement the structure swings about an axis perpendicular to both of the guiding arms, so that the guide 28 is vertical and the guide 23 horizontal. The guide 28, it will be noted in Fig. 1, projects at opposite sides of the guide 23, so that the jet-delivering means may be propelled along one part while cutting the top flanges and along the other part while cutting the web. As the result of swinging the guiding structure through 90° the jets are in proper angular relation to the web, and if the parts were properly adjusted at the beginning they are also at the proper height and at the proper distance from the

web. If not, the proper distance is secured by adjusting the guide 28 sidewise on the guide 23, and the carriage 33 is adjusted along the guide 28 until the jet-delivering means or torch tip is directed at the top of the web of the beam, so that the jets in starting will play upon the corner formed by the junction of the web and flange. This is the position shown in Fig. 3. The jets were preferably turned off after completing the cutting of the top flanges, and in this case the heating jet is now again turned on and lighted, after which the oxygen jet is turned on. The handle 37 is again turned to propel the jet-delivering means vertically downward across the web, which is thus cut through. The jets are again turned off. At this stage, the rail or beam is severed with the exception of the bottom flanges, and these may be easily broken across by suitable mechanical means, without further gas cutting. If a clean severance is desired, however, the jets are caused to travel across the bottom of the beam or rail. First the tip or nozzle 19 is moved outward to the left to a distance to clear the left-hand basal flange, this being accomplished by turning the handle 36 so as to propel the guide 28 laterally along the guide 23. The carriage 33 is then released from the screw 34 by means of the device 40, so that it drops quickly down below the beam, to the position shown in Fig. 4. The jet-delivering means or torch is then turned on the carriage through an angle of 90°, so that the jets are directed vertically upward against the base of the beam or rail. The jets are again turned on, and the handle 36 is turned in the reverse direction so as to carry the jets across beneath the beam. This completes the cutting of the beam; and it will be observed that the jet-delivering means has been caused to travel around three sides of the bar or beam by straight line movements. It will be understood that numerous changes may be made in the device without departing from the invention.

What is claimed as new is:

1. A device of the character described, comprising a clamp adapted to be applied to a beam, rail or other bar, a straight transverse guide member supported by said clamp and angularly movable relatively thereto so as to be capable of occupying positions at right angles to each other across two sides of the beam or rail, a carriage mounted for travel on said guide member, jet-delivering means angularly adjustable on said carriage so as to be directed against either side of the beam or rail, and means for propelling the carriage.

2. A device of the character described, comprising a support adapted to be attached to a beam, rail or other bar, jet-delivering means, and a straight guide along which

said jet-delivering means is propelled pivoted on said support to enable the jet-delivering means to travel across different sides of the bar.

3. A device of the character described, comprising a support adapted to be attached to a beam, rail or other bar, means for guiding suitable jet-delivering means in straight line travel across the bar, means for mechanically propelling the same, said guiding and propelling means both being mounted to swing on said support to enable said jet delivering means to act on different sides of the bar.

4. The combination of a support, an elongated guide member tiltably mounted thereon, a carriage on said guide member, a propelling screw mounted on and parallel to the guide member and in engagement with the carriage, and jet-delivering means carried by said carriage.

5. A device of the character described, comprising a support adapted to be attached to a beam, rail or other bar, a compound guide structure pivoted to said support and comprising guides at right angles to each other one being movable on the other, the pivotal axis of said structure being perpendicular to a plane parallel to both guides and parallel to the longitudinal axis of the beam or rail, and a jet-transporting carriage mounted on the guide which is movable on the other.

6. A device of the character described, comprising a support adapted to be attached to a beam, rail or other bar, jet-delivering means, and successively-supported guiding and propelling mechanisms angularly related to each other and angularly movable as a whole with reference to said support, whereby said jet-delivering means may be caused to travel across three sides of a beam or rail.

7. A device of the character described, comprising a support adapted to be attached to a beam, rail or other bar, a guide arm pivoted on said support, a second guide member at right angles to the first, means for propelling the second along the first, a carriage, means for propelling said carriage along the second guide member, and jet-delivering means angularly adjustable relatively to said carriage about an axis parallel to the pivotal axis of the first guide arm.

8. A device of the character described, comprising a support adapted to be attached to a beam, rail or other bar, a guide arm pivoted at one end on said support, a second guide arm movable along the first, said second guide arm being mounted intermediate its ends on the first guide arm and at right angles thereto, and jet-transporting means movable along the second guide.

9. A device of the character described, comprising a support adapted to be at-

tached to a beam, rail or other bar, a member angularly movable on said support, a guiding member rectilinearly adjustable on said angularly movable member, jet-delivering means, and means for propelling the same on said guiding member at right angles to the direction of adjustment thereof.

10. A device of the character described, comprising a support adapted to be attached to a beam, rail or other bar, a guide arm angularly movable on said support about an axis intermediate its ends to occupy positions at 90° distance, means for delivering heating and oxidizing jets, and means for propelling the same along said guide arm.

11. A device of the character described, comprising a support adapted to be attached to a beam, rail or other bar, jet-delivering means, mechanism, freely movable on said support through an angular distance of 90°, for rectilinearly guiding and propelling said jet-delivering means, and means for limiting the angular movement of said mechanism and for holding the same at either position.

12. A device of the character described, comprising a clamp having relatively movable jaws adapted to grasp opposite edges of a beam, rail or other bar, a guide arm pivoted to one of said jaws, a guide member at right angles to and movable along said guide arm, a carriage mounted on said guide member, means for propelling the carriage, and a torch holder rotatably mounted thereon.

13. A device of the character described, comprising a support adapted to be attached to a beam, rail or other bar, a guide arm mounted on said support, a second guide arm at right angles to and movable lengthwise of the first, and an angular arm projecting laterally from the second guide arm and carrying jet-delivering means, the said arm being movable lengthwise of the

second guide arm and also movable to different angular positions thereon, whereby the jet delivering means may be caused to travel across two sides of the beam without angular adjustment of the guide arms.

14. A device of the character described, comprising a support adapted to be attached to a beam, rail or other bar, a guide arm mounted on said support, a second guide arm at right angles to and movable lengthwise of the first, a third arm projecting laterally from the second guide arm and movable lengthwise thereof, and jet-delivering means carried by said third arm and angularly adjustable to direct the jets either perpendicular or parallel to the second guide arm.

15. A device of the character described, comprising a support adapted to be attached to a beam, rail or other bar, a compound guide structure pivoted to said support and comprising guides at right angles to each other and to the pivotal axis, one being movable on the other, an arm movable lengthwise of and projecting laterally from the guide which is movable on the other, and jet-delivering means carried by said arm and angularly movable relatively thereto so as to play upon different sides of the work.

16. A device of the character described, comprising a support adapted to be clamped to a beam, rail or other bar, jet-delivering means, mechanism for propelling the jet-delivering means, and means for guiding the same in straight line movements across different sides of the work and independently thereof.

In witness whereof I have signed my name in the presence of two subscribing witnesses.

WORTHY C. BUCKNAM.

Witnesses:

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LUELLA F. LITTLE.