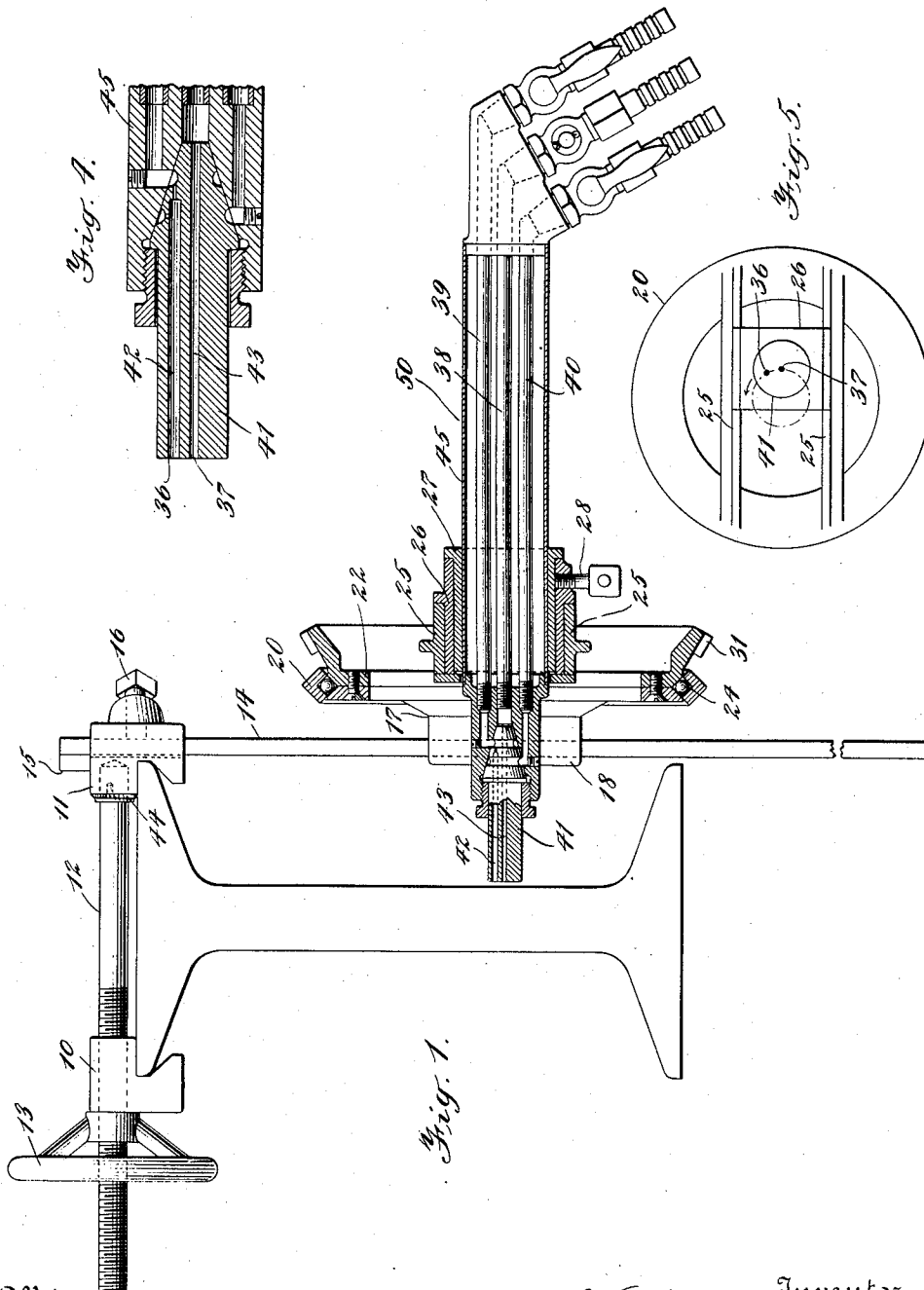


W. C. BUCKNAM.
 ROTARY BLOWPIPE APPARATUS.
 APPLICATION FILED JULY 20, 1912.

1,049,807.

Patented Jan. 7, 1913.

2 SHEETS—SHEET 1.



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2 SHEETS-SHEET 2.

Fig. 2.

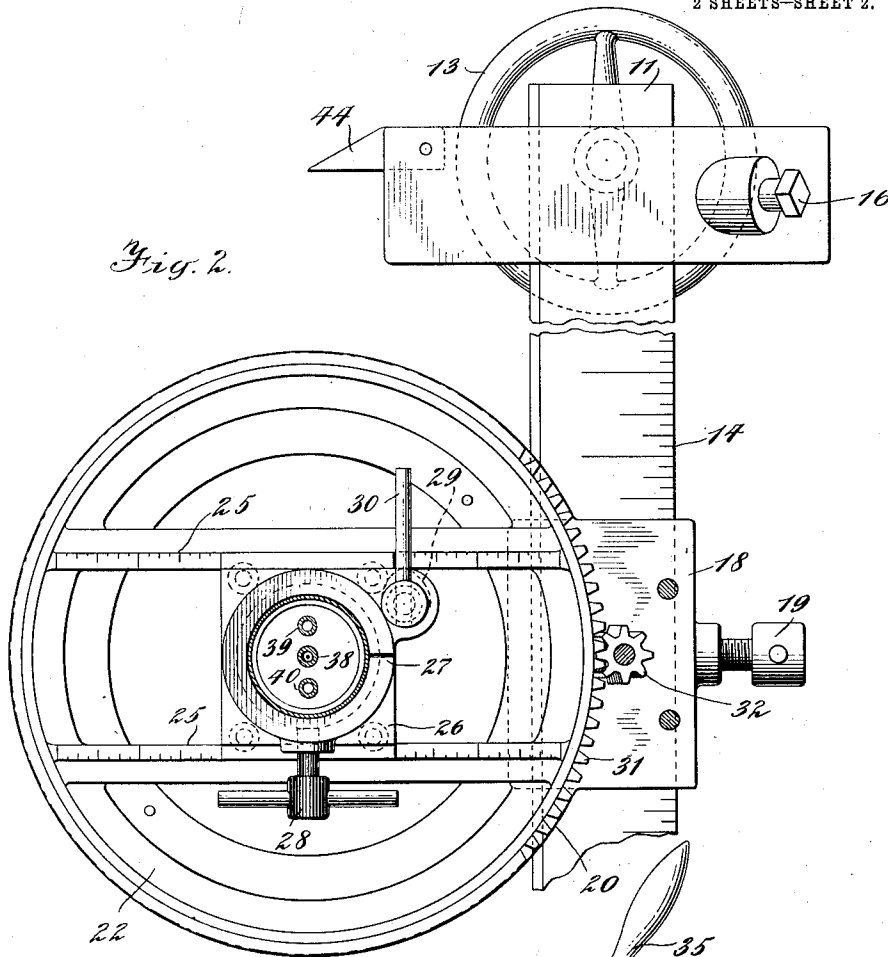
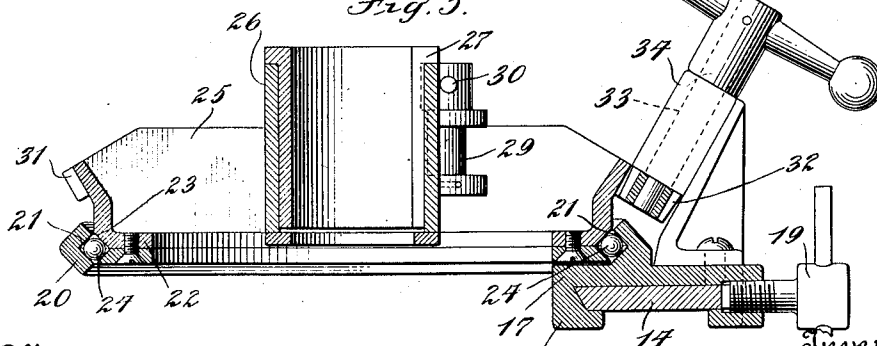


Fig. 3.



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UNITED STATES PATENT OFFICE.

WORTHY C. BUCKNAM, OF JERSEY CITY, NEW JERSEY, ASSIGNOR TO DAVIS-BOURNONVILLE COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

ROTARY-BLOWPIPE APPARATUS.

1,049,807.

Specification of Letters Patent.

Patented Jan. 7, 1913.

Application filed July 29, 1912. Serial No. 712,037.

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 Rotary-Blowpipe Apparatus, of which the following is a specification.

This invention relates to means for supporting and circularly 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, wherein, as is well known, a cutting jet of oxygen is assisted by a heating jet or jets composed of a combustible mixture, for example oxygen and acetylene.

The object of the invention is to provide a simple and convenient apparatus whereby the jet-delivering means may be caused to describe circles of different sizes and of as small diameter as may be desired, at uniform speed.

The special object of the invention is to produce a simple and efficient device for cutting small circular openings of variable sizes in beams, rails or other bars.

To these ends the invention consists in the parts and combinations hereinafter described with reference to the preferred embodiment shown in the accompanying drawings and as more particularly set forth in the appended claims.

In the said drawings: Figure 1 is a sectional side view of the apparatus applied to an I-beam; Fig. 2 is a back view thereof, parts being in section and others broken away; Fig. 3 is a horizontal section; Fig. 4 is a detail longitudinal section taken through the forward part of a form of torch that may be employed; and Fig. 5 is a semi-diagrammatic view indicating the operation of the device.

A horizontally-acting clamp, comprising suitably formed jaws 10, 11, is adapted to grasp opposite flanges or edges of a beam or bar or the ball or base of a rail. It is preferably applied to the top of the beam or the like, though this is not essential. The clamp is shown as including a rod 12, to which the jaw 11 is secured and along which the jaw 10 is slidable, being advanced by an internally threaded hand wheel 13 engaging threads on the rod. A suitable ver-

tical member, here shown as a flat bar 14, is supported by the jaw 11, and is preferably vertically adjustable through an opening therein, being provided at its upper end with a stop 15 to limit its downward movement. The vertical member may be set at any height by a locking screw 16.

While the clamp is referred to as horizontally-acting and the bar 14 is designated a vertical member, it will be understood that these are relative terms based on the assumption that the web of the beam or rail to be operated on is vertical, and that the device may be applied to the work in any position.

A carriage 17 is vertically adjustable on the bar 14, being provided with a suitable slide 18 receiving the bar. This carriage is set at any suitable height on the bar by means of a locking screw 19. The said carriage supports an annular frame 20 at one side of the vertical member or bar, the said frame being preferably formed with a V-shaped ball raceway 21. A rotatable circular carrier 22 is supported by the said frame, and is preferably provided with a complementary raceway 23, balls 24 being interposed between the two. The carrier is in effect rim-journaled on the carriage 17, and it is located at one side of the vertical member on which it is vertically adjustable, so that this member does not interfere with the torch or blow-pipe 44 in its circular movement.

The carrier 22 is preferably in the form of a ring, and it is provided with parallel transverse guides 25 between which is a diametrical opening through which the torch projects. A carriage or block 26 is slidable along these guides and is formed with a circular opening for the reception of the split collar or torch-holder 27, which may be tightened on the torch by means of a screw 28. The carriage 26 may be locked at any adjustment by a cam 29 having a handle 30.

An annular gear 31 is formed on or secured to the carrier 22, and is meshed by a small pinion 32 on the end of a shaft 33 journaled in a bracket 34 secured to the slide 18. The illustrative device herein shown is to be hand driven, and accordingly the shaft 33 carries a crank handle 35. To avoid interference of the hand with the torch, the shaft 33 is preferably inclined away from

the carrier 22, and the gear 31 is correspondingly beveled. Thus, suitable means are provided for rotating the carrier at uniform slow speed, which is essential for successful cutting.

The torch 50 is adjustable in its holder 27 toward and from the work, so that the jets may be disposed at the proper distance therefrom irrespective of the width of the flanges grasped by the clamp. To this end it is shown as provided with a cylindrical body or casing 45 which is slidable in the said holder. The torch has conduits for leading the different kinds of gases and jet orifices for delivering the heating and cutting jets, indicated at 36, 37, substantially parallel to the axis of rotation of the carrier 22 and in a manner to impinge in spaced relation upon the work. While only one heating jet is shown, it will be understood that there may be more. The single heating jet shown proceeds around the circle and is trailed by the cutting or oxygen jet. The torch is shown as provided with three conduits, 38 for the oxygen for the cutting jet, 39 for the oxygen for the heating jet, and 40 for the acetylene or combustible gas for the heating jet. These conduits have suitable valved connections to which are attached flexible tubes leading from the sources of supply. The construction of the removable and replaceable nozzle or tip 41, having the heating and cutting jet passages 42, 43 need not be particularly described herein, as it forms the subject-matter of prior patents.

In operation, the clamp is affixed to the top or bottom of the beam, rail or other bar, with the vertical member 14 projecting downward or upward, as the case may be. The carriage 17 is now adjusted to the proper height, either by moving it on the vertical member 14 or by moving the latter on the clamp. This adjustment is preferably secured, however, by sliding the carriage on the vertical member. Graduations on the said member serve to indicate when the proper height has been reached. The vertical adjustment of the bar 14 is useful when it is necessary to raise the bar to avoid obstructions. An index or pointer 44 carried by the clamp jaw 11 and terminating in the vertical plane of the axis of rotation of the carrier 22 enables the whole device to be set to a mark made on the top of the beam or rail indicating the point along the length of the beam where the hole is to be cut. The group of jets is adjustable from the axis of rotation outward, so that circles may be cut of any diameter within the range of the device, especially small circular openings. The distance of the cutting jet from the center of rotation, that is to say the radius of the hole to be made, is indicated by a scale formed on one or both of the guides 25. The torch is inserted in the holder with its jet orifices at

the proper distance from the web of the beam or rail, this adjustment being secured by merely moving the torch as a whole in or out. The line passing through the jet orifices is tangential to the circle to be cut, and the heating jet is in advance. The heating jet is turned on and lighted, after which the cutting jet is turned on. The carrier is now rotated at a slow uniform speed and the circular hole is quickly and easily cut.

While the preferred construction and mode of operation have been described in detail, it will be understood that numerous changes may be made and that the features of the invention or part of them may be embodied in other specifically different apparatus.

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

1. In a device for the circular cutting of beams, rails and other bars by means of gases, the combination of a supporting structure having a suitable means for attachment to the bar, a circular carrier supported thereby and having transverse holding and guiding means, means for rotating said carrier, and gas cutting means on said carrier adjustable relatively to the axis of rotation on said holding and guiding means.

2. In a device of the character described, the combination of a supporting structure having suitable means for attachment to a beam, rail or other bar, a frame supported thereby, a circular carrier rim-journaled on said frame, and a cutting torch passing through and adjustable across said carrier so as to cut circles of different diameters in the bar.

3. In a device of the character described, the combination of suitable means to clamp on a beam, rail or other bar, a vertical member carried thereby, a carriage vertically adjustable on said member, a circular carrier rim-journaled on said carriage at one side of said member and bearing an annular gear, driving means on said carriage engaging said gear, and gas cutting means adjustable on said carrier relatively to the axis of rotation.

4. In a device of the character described, the combination of transversely acting means of attachment to a beam, rail or other bar, a vertical member supported thereby, a carriage vertically adjustable on said member, a rotary carrier supported by said carriage with its axis of rotation to one side of said vertical member and at right angles to the perpendicular, and heating and cutting jets carried by said carrier.

5. In a device of the character described, the combination of a supporting structure having suitable means for attachment to a beam, rail or other bar, a frame supported thereby, a carrier rim-journaled on said

frame and bearing an annular gear, driving means engaging with said gear, and gas cutting means passing through and adjustable on said carrier relatively to the axis of rotation so as to cut circles of different diameters in the bar.

6. The combination of a support, a rotary carrier rim-journaled on said support, and a blow-pipe passing through and adjustable across said carrier.

7. The combination of a supporting frame, a circular carrier rotatably mounted thereon and having a diametrical opening, a carriage adjustable along said opening, across the circular carrier, and a blow-pipe carried by said carriage.

8. The combination of a support, an annular carrier rim-journaled thereon and having a transverse guide, means for rotat-

ing said carrier, and a blow-pipe adjustable along said guide.

9. The combination of a support, a circular rotary carrier, gas cutting means supported by and adjustable across the axis of rotation of said carrier and having heating and cutting jets arranged to deliver their streams approximately parallel to said axis and in spaced relation upon the work, and mechanism for driving said carrier at low speed.

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

WORTHY C. BUCKNAM.

Witnesses:

J. F. BRANDENBURG,
LUELLA F. LITTLE.