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WELDING.

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1,323,485.

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Fig. 1.

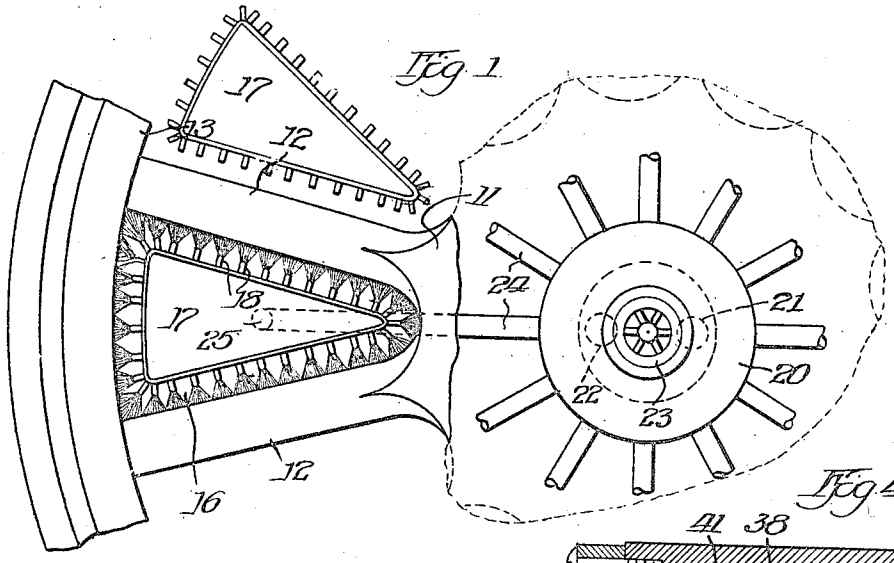


Fig. 4.

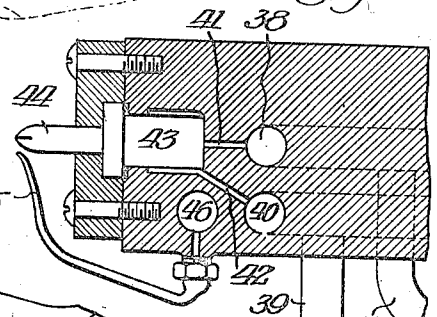


Fig. 2.

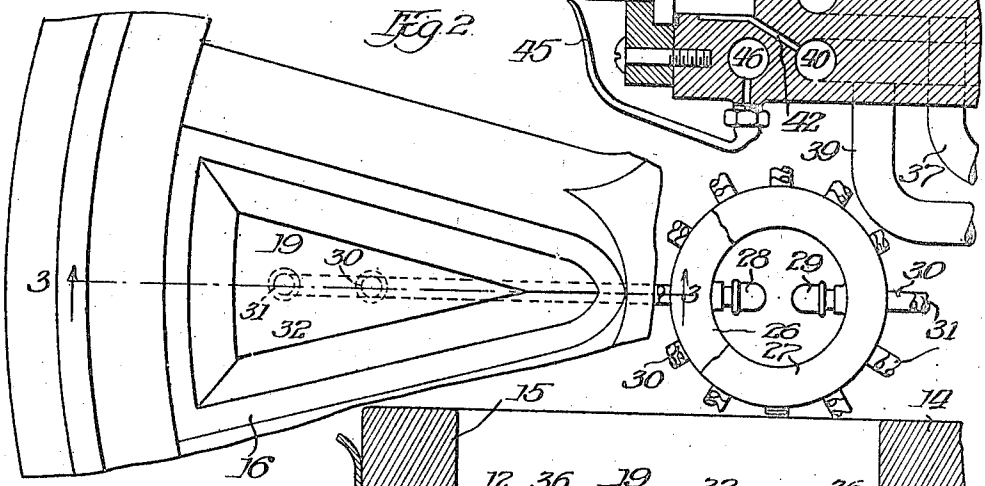
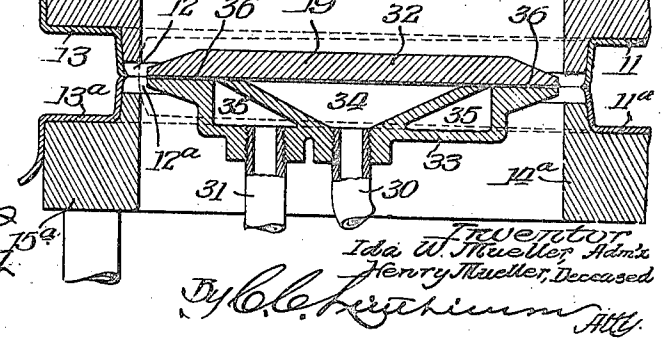


Fig. 3.



Witnesses:

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UNITED STATES PATENT OFFICE.

HENRY MUELLER, DECEASED, LATE OF CHICAGO, ILLINOIS, BY IDA W. MUELLER, ADMINISTRATRIX, OF CHICAGO, ILLINOIS, ASSIGNOR TO GEORGE H. FORSYTH, OF CHICAGO, ILLINOIS.

WELDING.

1,323,485. Specification of Letters Patent. Patented Dec. 2, 1919.

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To all whom it may concern:

Be it known that HENRY MUELLER, late a subject of the Emperor of Germany, and a resident of Chicago, in the county of Cook and State of Illinois, did invent certain new and useful Improvements in Welding, of which the following is a specification.

The invention has for its principal object the application of a welding flame to the abutting edges of members in such manner as to bring all the meeting portions over an extended area to a welding temperature simultaneously.

While the invention is applicable to a wide range of uses it is particularly advantageous as applied in the welding of sheet metal halves of various objects such for instance as sheet steel wheels for vehicles and it is in connection with such use that the invention is herein illustrated and described. In the accompanying drawings—

Figure 1 is a fragmentary top plan view showing the invention as applied to the hub, rim and spokes of a sheet metal wheel;

Fig. 2 is a similar view of a modified form of burner;

Fig. 3 is a vertical section on the line 3—3 of Fig. 2; and

Fig. 4 is a fragmentary vertical section on an enlarged scale illustrating the distribution of the gaseous mixture, applicable to either form of burner shown in Figs. 1 and 2.

In the drawings the reference numerals 11 and 11ª represent coöperating hub portions of the upper and lower halves of a sheet metal wheel, 12 and 12ª the spoke portions of the upper and lower halves, and 13 and 13ª the rim portions of the upper and lower halves, the said upper and lower halves of the wheel being held in pressure contact between clamp members 14 and 14ª and 15 and 15ª, bearing respectively upon the hub and rim portions.

Within each of the generally triangular spaces 16 embraced by the hub, rim and adjacent spokes is disposed a burner indicated in Fig. 1 by the reference numeral 17, which is of the same general shape as the said space, said burner having nozzles or burner tips 18 projecting toward and extending to points substantially equidistant from the line to be welded and formed of the abutting edges of the hub, spoke and rim portions of the upper and lower halves of the wheel whereby the jets of flame from the burner will be applied simultaneously and uniformly throughout the entire extent of the line of surfaces to be welded together.

In Fig. 2 the conditions are substantially the same with the exception that instead of being provided with nozzles or burner tips the burner 19 furnishes a continuous jet adapted to present a continuous sheet of flame to the line of surfaces to be welded from which it is likewise arranged substantially equidistant throughout.

Having reference more particularly to Fig. 1, the gaseous mixture, which may be oxygen and acetylene, oxygen and hydrogen, or other suitable mixture, is supplied to each of the burners from a central mixing vessel 20 to the interior of which the two gases are introduced through ports 21 and 22 controlled jointly by a valve 23, the mixed gases being conducted through pipes 24 leading one to each burner at the point 25.

According to the construction illustrated in Fig. 2, two centrally arranged feed headers 26 and 27 are supplied respectively with gas through the feed pipes 28 and 29, and the gas is conducted from each of the feed headers 26 and 27 by means of pipes 30 and 31 to the burner 19 which, as clearly shown in Fig. 3, comprises a cover plate 32 and a body portion 33, the latter providing a central chamber 34 for the gas conducted by the pipe 30 and an annular chamber 35 for the gas conducted by the pipe 31. Here, it will be observed, both kinds of gas are independently supplied to the burner and are allowed to mix first when they leave the burner through the jet passage 36.

In Fig. 4 is shown another form of mixing burner, one of the gases being supplied by the pipe 37 to an annular chamber 38 while the other gas is supplied by the pipe 39 to the annular chamber 40. From the chambers 38 and 40 the gases are conducted through the channels 41 and 42 to the annular mixing chamber 43 whence they are supplied either to burner tips 44 or through a continuous jet passage, a pilot burner 45 being supplied with gas from a chamber 46. This manner of mixing is applicable alike to both the form of burner shown in Fig. 1 and that in Fig. 2.

A characteristic feature of the invention is the employment of a burner adapted to direct a substantially continuous sheet of flame simultaneously against the abutting edges of surfaces to be welded throughout their extent as distinguished from the application of a welding flame progressively along the meeting line of surfaces to be welded. Where extended areas are to be united and particularly in the case of surfaces divided into a number of isolated portions as typified by metal wheel construction it has been found to be exceedingly difficult to effect a uniform junction of parts, for the reason that in the welding operation those portions being welded yield toward each other under the welding heat and the pressure of the clamping members, while those portions which have not yet been subjected to a welding heat resist the clamping action and maintain their original position thus leading to a deformation with resultant lack of symmetry in the completed article. According to the present invention the meeting edges of the hub, rim and spoke portions throughout the circumference of the wheel, being held under pressure contact with each other, are simultaneously heated by the admission of the gas to the several burners under the control of the central valve 23 whereby the meeting edges are heated and the welding takes place simultaneously throughout the extent of the wheel the parts yielding and uniting uniformly.

It is to be understood that as used in this specification and in the claims the terms "abutting", "contact", "meeting", and the like as applied to the edges of the sheets to be welded, are relative terms and are not to be interpreted as limiting to a direct contact as distinguished from an indirect contact as where a welding strip or wire is inserted between the edges and the two held together thereon.

Claims:

1. The combination with means to hold in contact an extended line of abutting surfaces to be welded, of a burner for welding arranged to direct its flame simultaneously upon the edges to be welded throughout their length, and means to supply fuel to the burner.

2. The combination with means to press together an extended line of abutting surfaces to be welded, of a burner for welding arranged with its jet directed toward and substantially equidistant from the surfaces to be welded throughout their length, and means to supply gaseous fuel to the burner.

3. The combination with means to press together an inclosed line of abutting surfaces to be welded, of a burner for welding arranged within the inclosed space with its jet directed toward and substantially equidistant from the abutting surfaces throughout their extent, and means to supply gaseous fuel to the burner.

4. The combination with means to press together the two halves of a sheet metal body superposed with their edges abutting, of a burner for welding having its jet directed toward and substantially equidistant from the abutting edges, and means to supply a gaseous fuel to the burner.

5. The combination with means to maintain in pressure contact the two halves of a sheet metal wheel comprising hub and spoke portions superposed with their edges abutting, of a burner disposed within the space embraced by the hub and a pair of adjacent spokes, the burner being of a shape approximating that of the said space and having its jet directed toward and substantially equidistant from the abutting edges, and means to supply a gaseous fuel to the burner.

6. The combination with means to hold the two halves of a sheet metal wheel comprising hub and spoke portions superposed with their edges abutting, of a burner disposed within each of the spaces embraced by the hub and adjacent spokes, each burner having its jet directed toward and substantially equidistant from the adjacent abutting edges, means to supply gaseous fuel to the burners, and means to control said supply to the several burners in unison.

7. The combination with means to maintain in pressure contact the two halves of a sheet metal wheel comprising hub, spoke and rim portions superposed with their edges abutting in the median plane of the wheel, of a burner disposed within each of the spaces inclosed between the rim, hub and adjacent spokes, the burner being of a shape approximating the inclosed space and having its jet directed toward and substantially equidistant from the adjacent abutting edges, means to supply a gaseous fuel mixture to each burner, and means to control in unison the supply of fuel to all of the burners.

8. The method of welding the superimposed halves of sheet metal wheels and like bodies having isolated portions to be welded which consists in applying a welding flame simultaneously to the abutting edges of the halves of the hub and the several spoke and rim portions.

9. The method of welding abutting surfaces of extended length which consists in applying a welding flame thereto simultaneously throughout the extent of the portion to be welded and at the same time exerting pressure toward the line of abutment to bring said portions into more intimate contact.

10. The combination with means to hold together the meeting edges of isolated por-

tions of a body composed of a plurality of metal parts, of a welding burner arranged to direct a flame simultaneously upon the meeting edges of such isolated portions and throughout the length of said edges, and means to supply fuel to the burner.

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

IDA W. MUELLER,
Administratrix for Henry Mueller.

Witnesses:
LEWIS T. GREIST,
BENNO MUELLER.