

D. McF. MOORE.
 HAND FIRE FOR MAKING JOINTS IN VACUUM TUBE LAMPS.
 APPLICATION FILED FEB. 28, 1907.

1,014,247.

Patented Jan. 9, 1912.

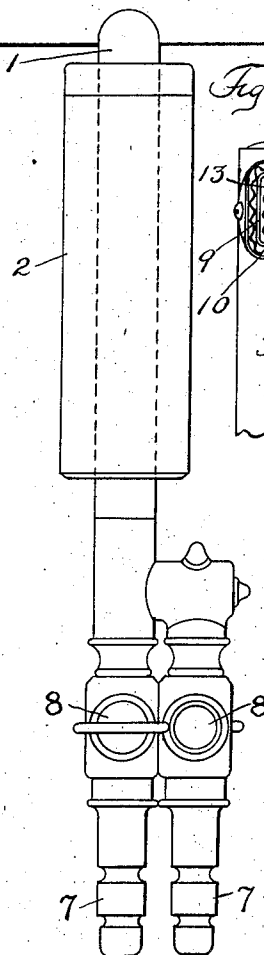
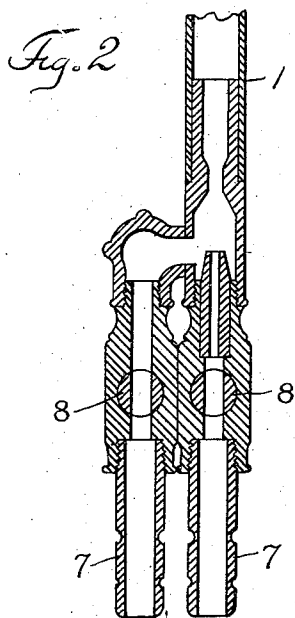
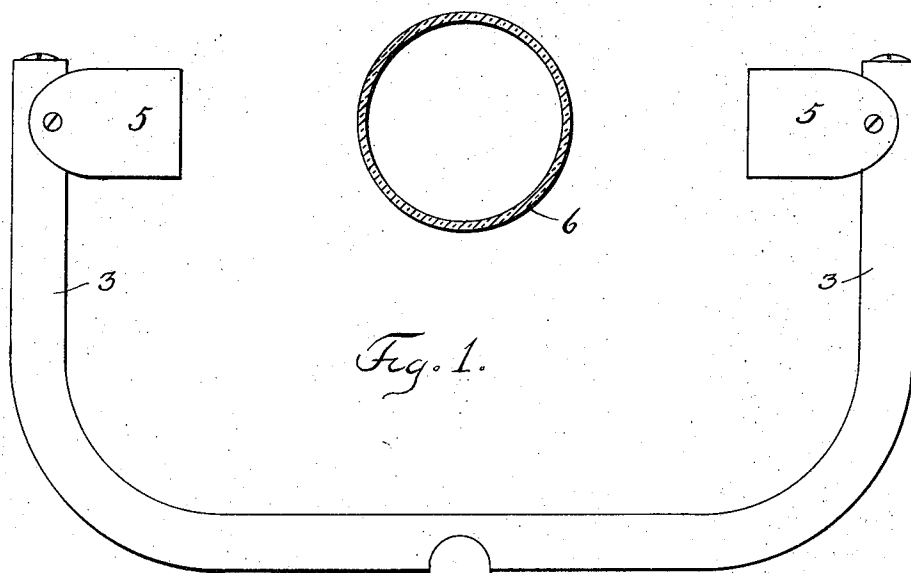


Fig. 3. Fig. 4.

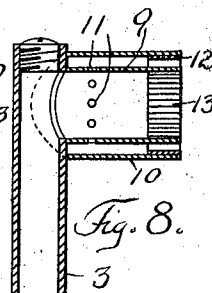
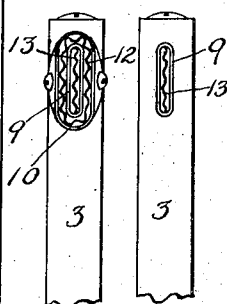


Fig. 5.

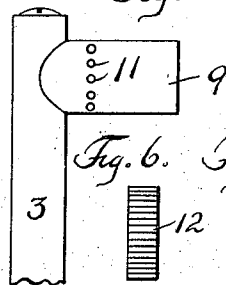
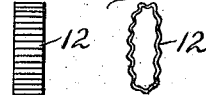


Fig. 6. Fig. 7.



WITNESSES:

C. F. Tischer Jr.
Lillian Blond

INVENTOR

Daniel McFarlan Moore

BY

Townsend & Decker
 ATTORNEYS

UNITED STATES PATENT OFFICE.

DANIEL McFARLAN MOORE, OF NEWARK, NEW JERSEY, ASSIGNOR TO MOORE ELECTRICAL COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

HAND-FIRE FOR MAKING JOINTS IN VACUUM-TUBE LAMPS.

1,014,247.

Specification of Letters Patent.

Patented Jan. 9, 1912.

Application filed February 26, 1907. Serial No. 359,447.

To all whom it may concern:

Be it known that I, DANIEL McFARLAN MOORE, a citizen of the United States, and a resident of Newark, in the county of Essex and State of New Jersey, with post-office address 52 Lawrence street, have invented certain new and useful Improvements in Hand-Fires for Making Joints in Vacuum-Tube Lamps, of which the following is a specification.

My invention relates to an improved hand fire for glass blowers' use in making joints in glass tubing, and is especially designed to provide a device whereby a joint may conveniently and effectively be formed between sections of tubing after they have been installed in place to make a continuous line of tubing as is required in my improved system of vacuum tube lighting.

Briefly stated, my invention consists of an improved hand fire comprising a pair of flat flame burners mounted opposite one another on their gas supply tubes and adapted to deliver a flat flame, the plane of which shall coincide with or be parallel to the plane of the joint between two sections of tubing.

My invention consists further in the general construction and the special details hereinafter more particularly described and then specified in the claims.

In the accompanying drawings, Figure 1 is a side elevation of a hand fire embodying my invention. Fig. 2 is a vertical section through the base of the same. Fig. 3 is an end view of the double burner applied to its tube. Fig. 4 is an end view of the inner portion of the burner applied to its tube, the outer portion being removed. Fig. 5 is a side elevation of the part shown in Fig. 4. Fig. 6 is a side view of the corrugated strip used for insertion in the outer burner. Fig. 7 is a view of the corrugated plate or strip used between the inner and outer burners looking toward the edge of the corrugated strip, and Fig. 8 is a vertical longitudinal section through one of the burners and tube therefor.

1 indicates a tube through which gas is fed to burners 5 mounted on the tubes 3 which branch from tube 1 and are so arranged that the burners 5 may embrace the work consisting of the tubing 6 between them.

2 is a suitable hand hold upon the tube 1

by which the hand fire may be manipulated and may be turned around the tubing 6 in the plane of the joint between the sections thereof.

At its base the supply tube 1 is provided, as indicated at 7, with means for attachment of the flexible tubing through which the two gases such, for instance, as hydrocarbon gas and air may be fed to the tube 1 through suitable regulating valves 8 by means of which the operator can graduate the proportions of air and hydrocarbon gas to give at the beginning of the operation a mild flame and later by modifying the proportions may produce a very hot flame.

The details of construction at the base of the tube 1 are clearly shown in the vertical central section Fig. 2, and as they involve simply the ordinary details of gas pipe fittings need not be described further.

The preferred construction of the burners 5 which are used for the hand fire is such that the flame or flames shall be delivered upon the tubing 6 as a flat flame localized in the plane of the joint in the tubing. That is to say, the plane of the flame is practically parallel to the plane of the joint. This effectually confines the heating to the joint itself. Preferably, also provision is made for producing a flame made up of a series of jets arranged side by side in the plane of the flame itself. In the preferred construction also the said flat flame is the resultant of the flames coming from two burners, one arranged within the other. To accomplish these results the inner oblong tube or burner 9 of brass is employed surrounded by another tube or burner 10 which conforms to the burner 9 and supplies a flame all around the same. The oblong tube or burner 9 has its major axis parallel to the tube 3 and consists of a piece of brass tubing soldered into a vertical opening in the pipe 3. The surrounding burner tube 10 is applied over the inner tube 9 and properly fixed to the tube 3. The burner tube 10 derives its supply from openings 11 formed in the inner tube and its flame is delivered as a series of fine jets produced by means of corrugated sheets of metal 12 set into the space between the tubes 9 and 10. The flame delivered by the inner tube 9 is also, preferably, made up of a series of jets arranged in a line parallel with the major axis of said oblong tube, said jets being pro-

duced by any desired means, as, for instance, by means of a corrugated plate 13, set into the burner tube 9. By these means a double flame is produced, the resultant of which is a flat flame extended in the plane of the joint to be formed in the tube 6 so that practically heat is applied effectively simultaneously at all points around the tubing 6 in the plane of its joint, the hottest portion being in line with the burners but being capable of being shifted to affect all portions of the joint by rotating the fire by means of handle 2.

What I claim as my invention is:

1. The improved portable hand fire for forming joints between sections of glass tubing, comprising a forked tubular frame flexibly connected with a gas supply and adapted to embrace the tubing to be joined, and a pair of flat flame burners mounted on the arms of the fork and adapted to each deliver a flat flame into the space between them, the plane of each flame being substantially parallel to the plane of the joint to be formed.

2. The improved portable hand fire for forming joints between sections of glass tubing, comprising a tubular support having two branches, each constituting a gas supply and each provided with a burner having an inner and outer oblong gas exit, the major axes of which are parallel to the axis of the gas tube, and corrugated plates arranged between said oblong tubes and in the major axis of the inner tube, as and for the purpose described.

3. The improved portable hand fire for forming joints between sections of glass tubing, comprising a forked support flexibly connected with a gas supply and adapted to embrace the work, each arm of the fork being provided with an oblong burner the major axis of which is substantially parallel to the plane of the fork, said burner comprising an inner oblong burner tube having perforations near its base, an outer

oblong burner tube and corrugated plates mounted in the space between the tubes and within the inner burner tube, as and for the purpose described.

4. The improved portable hand fire for forming joints between sections of glass tubing, comprising a pair of oblong burners set respectively on the two arms of a fork, said burners each containing a section of tube oblong in cross section secured in a vertical opening in its tubular support and projecting laterally therefrom each to deliver toward the other a flat flame whose plane is substantially parallel to the plane of the fork.

5. The improved portable hand fire for forming joints between sections of glass tubing, comprising a pair of burners carried by a forked support and each consisting of an oblong inner tube and an oblong outer tube with their major axes parallel substantially to the plane of the fork and connected to one another through perforations in the inner tube, a corrugated plate in the space between the tubes and a corrugated plate set in the inner tube in line with its major axis.

6. An improved hand fire for forming joints between sections of glass tubing comprising a pair of burners suitably mounted on a movable support flexibly connected to a gas supply, and each burner comprising an oblong inner tube, an oblong outer tube having communication with the inner tube through perforations therein, a corrugated plate in the space between the tubes and a corrugated plate set in the inner tube in line with its major axis.

Signed at New York in the county of New York and State of New York this 30th day of January A. D., 1907.

DANIEL McFARLAN MOORE.

Witnesses:

C. F. TISCHNER, Jr.,
LILLIAN BLOND.