

No. 663,822.

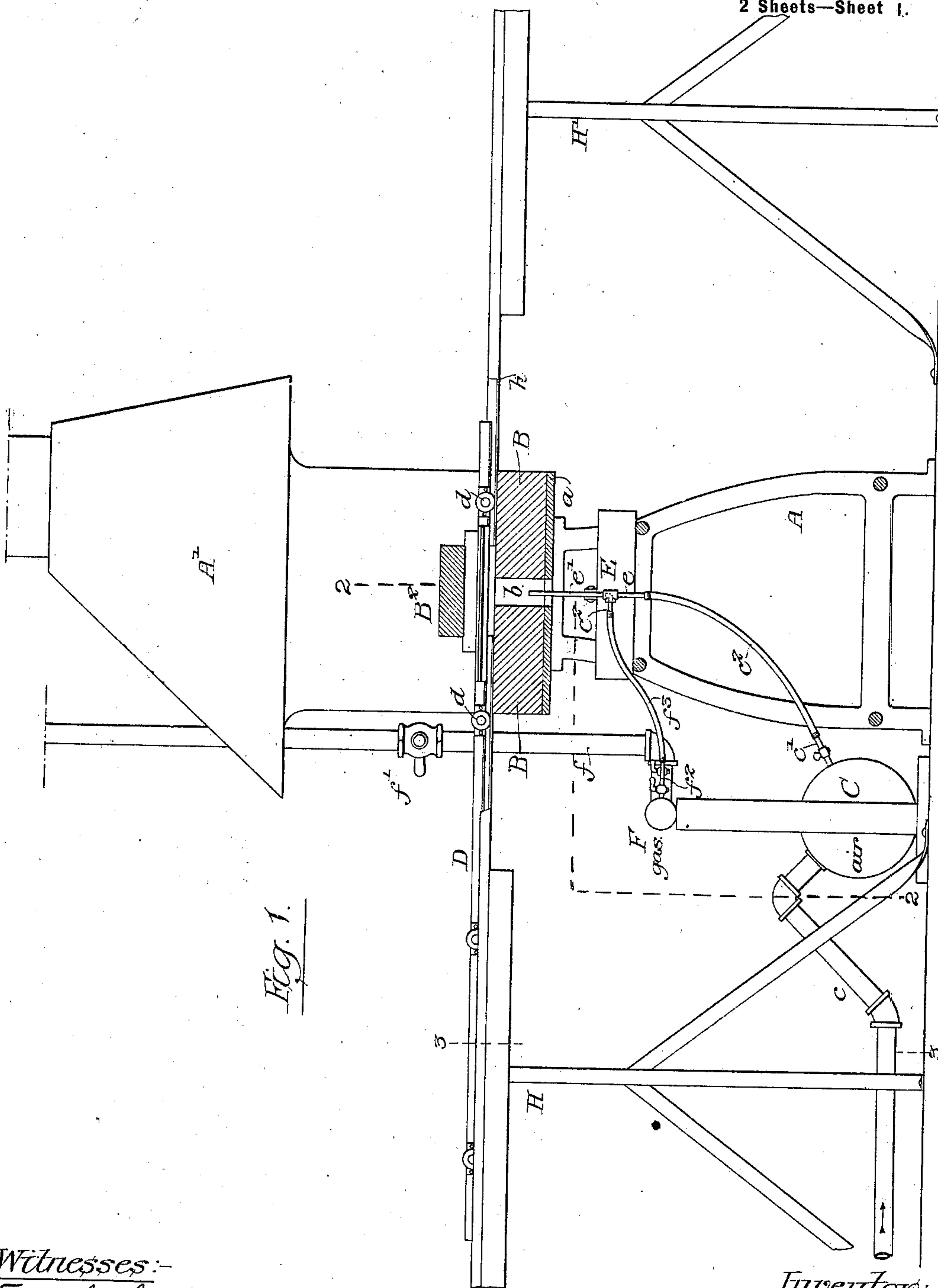
Patented Dec. 11, 1900.

D. H. WATTS.
BRAZING FURNACE.

Application filed Oct. 17, 1898.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses:-

Frank L. A. Graham.
Louis M. T. Whitehead.

Inventor:-

David H. Watts.

By his Attorneys:-

Flowers & Herbs

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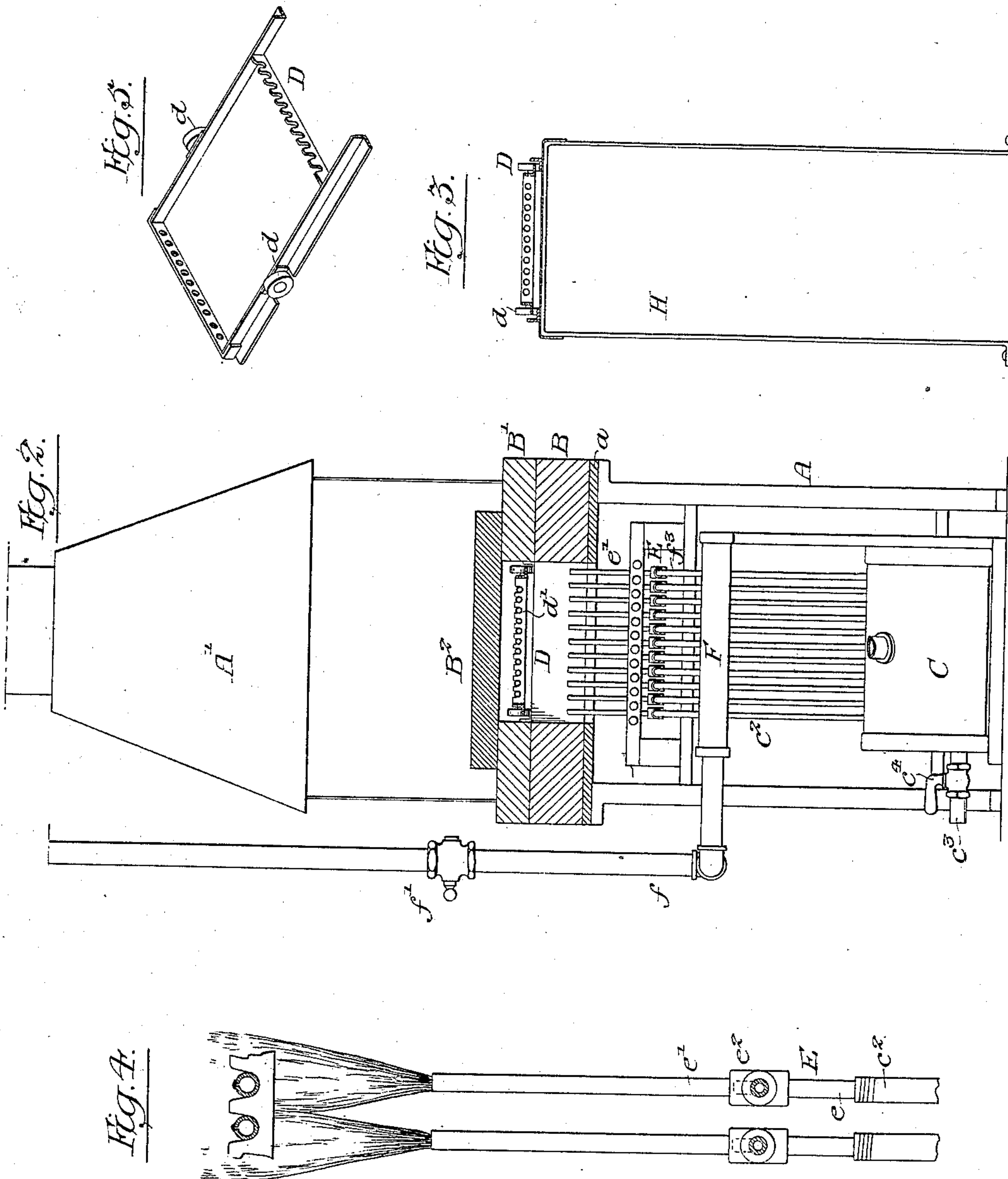
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David H. Watts
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UNITED STATES PATENT OFFICE.

DAVID H. WATTS, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO DAVID H. WATTS, JR., OF SAME PLACE.

BRAZING-FURNACE.

SPECIFICATION forming part of Letters Patent No. 663,822, dated December 11, 1900.

Application filed October 17, 1898. Serial No. 693,781. (No model.)

To all whom it may concern:

Be it known that I, DAVID H. WATTS, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Brazing-Furnaces, of which the following is a specification.

The object of my invention is to rapidly and thoroughly braze a series of tubes at one operation. This object I accomplish by mounting a number of tubes side by side upon a carriage and subjecting them to the action of a flame from a series of burners independently controlled, as fully described hereinafter.

In the accompanying drawings, Figure 1 is a longitudinal sectional view of my improved brazing-furnace. Fig. 2 is a transverse section on the line 2 2, Fig. 1. Fig. 3 is a section on the line 3 3, Fig. 1. Fig. 4 is an enlarged view showing the action of the flame upon the tubes, and Fig. 5 is a perspective view of a portion of the carriage.

Heretofore in the manufacture of tubes for umbrella and parasol handles particularly the tubes have been bent into form and their edges brazed together one at a time. Consequently the operation was slow and expensive. By my invention I bend the steel sheets in the form of tubes and then apply the brazing compound to the same, place a number of the tubes on the carriage side by side, and pass them over a flame from a series of burners.

The movement of the carriage is controlled by the operator, who can see that the tubes are thoroughly brazed, as the flame is exposed to view at all times.

In the present instance A is a frame, on the table *a* of which are mounted the blocks B of fire-brick, forming a passage *b* between them, and mounted on fire-bricks B' is a block B² of fire-brick, extending over the space *b*, but at such a height as to allow for the free travel of the carriage D over the space.

C is an air-cylinder connected by a pipe *c* to an air-pressure device, preferably an air-pump, so that a constant pressure of air is maintained in the cylinder C. Extending from this cylinder are a series of valved pipes *c'*, connected to the pipe *e* of the burner E by a flexible hose *c²*. This burner has a series of nozzles *e'*, which extend into the space *b*.

F is a gas-cylinder connected to a supply

through the pipe *f*, provided with a valve *f'* to cut off the supply of gas. The cylinder F has a series of valved pipes *f²*, which are connected to the extension *e²* of the burner E by a flexible hose *f³*, so that each of the series of burners E has an independent connection with both the chamber C and the gas-chamber F, and as each one of these connections is provided with a controlling-valve the quantity of air and gas admitted to each burner can be controlled, so that an even flame is insured.

When it is wished to reduce the pressure of air in the several pipes, I provide an outlet-pipe *c³* at the end of the chamber C, and in this outlet-pipe is a valve *c⁴*. On opening this valve air under pressure will escape from the cylinder, and consequently reduce the pressure in all the tubes. The supply of gas to the cylinder is controlled by the valve *f'*.

Extending from each end of the table are stands H H', supported by suitable framework. On these stands are rails *h*, which rest upon the fire-bricks B B, and adapted to the rails are the wheels *d* of the carriage D. This carriage D has a series of cross-bars *d'*, notched at their upper edges to receive the tubes to be brazed. At each end of the carriage is a cross-bar having holes, into which the tubes are forced, so as to keep the tubes separated and in position to be properly brazed, with the seams uppermost.

Supported on the frame A is a hood A' to carry off the waste products of combustion.

The brazing compound is first applied to the seams of the tubes to be brazed, and then the tubes are carefully placed on the carriage D, with their ends in the openings in the end cross-pieces, each tube resting in a notch in the cross-bars, so that they will be separated one from another. The flame is then regulated by the valves controlling the supply of air and gas, and if the flame is uneven the independent valves are adjusted so that an even flame is produced throughout the width of the furnace. The carriage is then moved slowly through the flame, and the tubes are subjected to the required heat and then slowly moved forward until the entire series of tubes has been brazed, the operator moving the carriage by hand. The

tubes are then removed and other tubes placed on the carriage.

I claim as my invention—

1. The combination in a tube-brazing machine, of a frame, a burner thereon, air and gas pipes connected to said burner, and a carriage movable through the machine for holding the tube to be brazed and for feeding it longitudinally through the machine above the burner, with the seam uppermost, substantially as described.

2. The combination in a tube-brazing machine, of a series of burners, air and gas pipes connected to said burners, and a valve for each air and gas pipe, a carriage arranged to travel over the burners, and means for supporting a series of tubes longitudinally arranged on the carriage with their seams uppermost, substantially as described.

3. The combination in a tube-brazing furnace, of a frame, a series of independent burners mounted side by side on said frame and having air and gas inlets, a cylinder for air under pressure, a series of pipes projecting from said cylinder and connected to the air-inlets of each burner, valves for controlling the passage of air through the several pipes, a gas-chamber having a series of pipes connected to the series of gas-inlets of the burners, and valves controlling the passage of gas through the pipes whereby the flame from each burner can be regulated, and a carriage so arranged as to support a series of tubes side by side, so that they can be traversed over the burners, substantially as described.

4. The combination in a tube-brazing furnace, of a frame, a series of independent burners mounted side by side on said frame, a gas-cylinder and an air-cylinder connected to the burners, controlling-valves for each connection, so as to regulate the supply of air and gas to the independent burners, an air-supply pipe and a valved air-exhaust pipe

communicating with the air-cylinder, and means for feeding the tubes longitudinally through the flames from the burners, substantially as described.

5. The combination of a frame having a table, fire-brick blocks mounted on the table and forming a space, a cover-block of fire-brick bridging over the space between the other blocks of fire-brick, a series of burners projecting into the space between the fire-bricks, an air-cylinder and a gas-cylinder each connected to the several independent burners, stands at each end of the frame, tracks on the said stands, and a carriage mounted on the tracks and arranged to carry a series of tubes to be brazed, substantially as described.

6. The combination in a tube-brazing furnace, of the frame, a series of burners arranged side by side across the frame, gas and air chambers connected to the independent burners, tracks on the frame and a carriage constructed to travel on the tracks, and notched cross-bars on the carriage constructed to receive and separate the series of tubes to be brazed, said notches being so arranged that the tubes resting therein will be made to travel longitudinally above the burners as the carriage is moved.

7. The combination in a tube-brazing furnace, of the burners, a carriage arranged to travel through the flame of the burners and having notched cross bars and an end cross-bar perforated to receive the tubes to be brazed, substantially as and for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

DAVID H. WATTS.

Witnesses:

JNO. W. GRIFFIN,
HORACE A. REEVES.