No. 842,191. PATENTED JAN. 29, 1907.

R. B. FLATHER.

ROTATING HEATING DEVICE FOR TUBULATING GLASS BULBS.

APPLICATION FILED APR. 21, 1906.

Fig. 1.

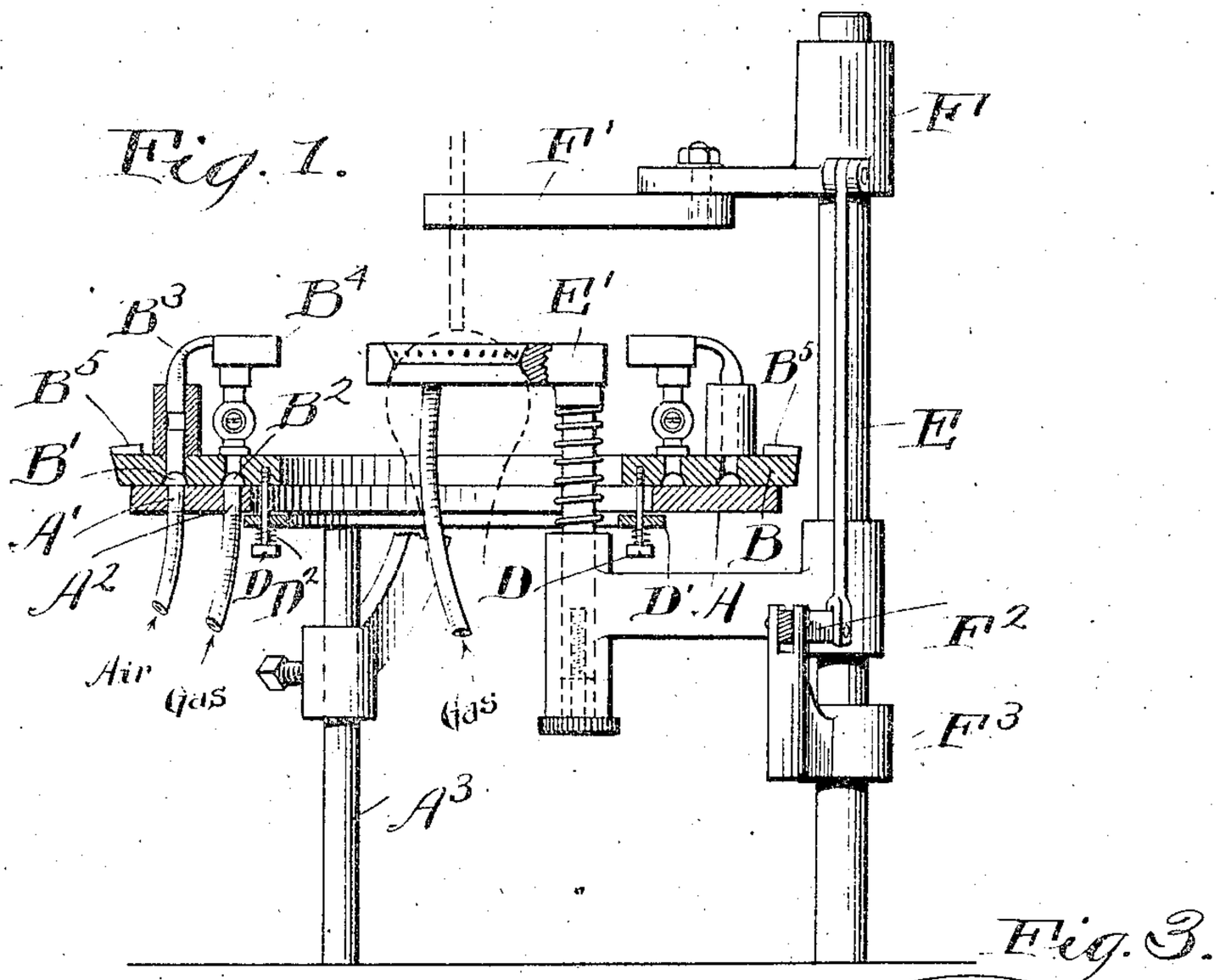


Fig. 3.

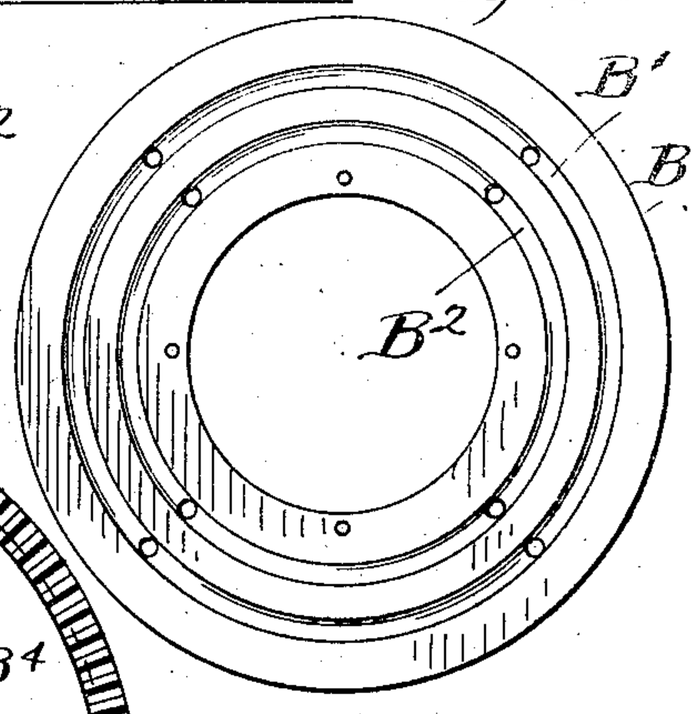
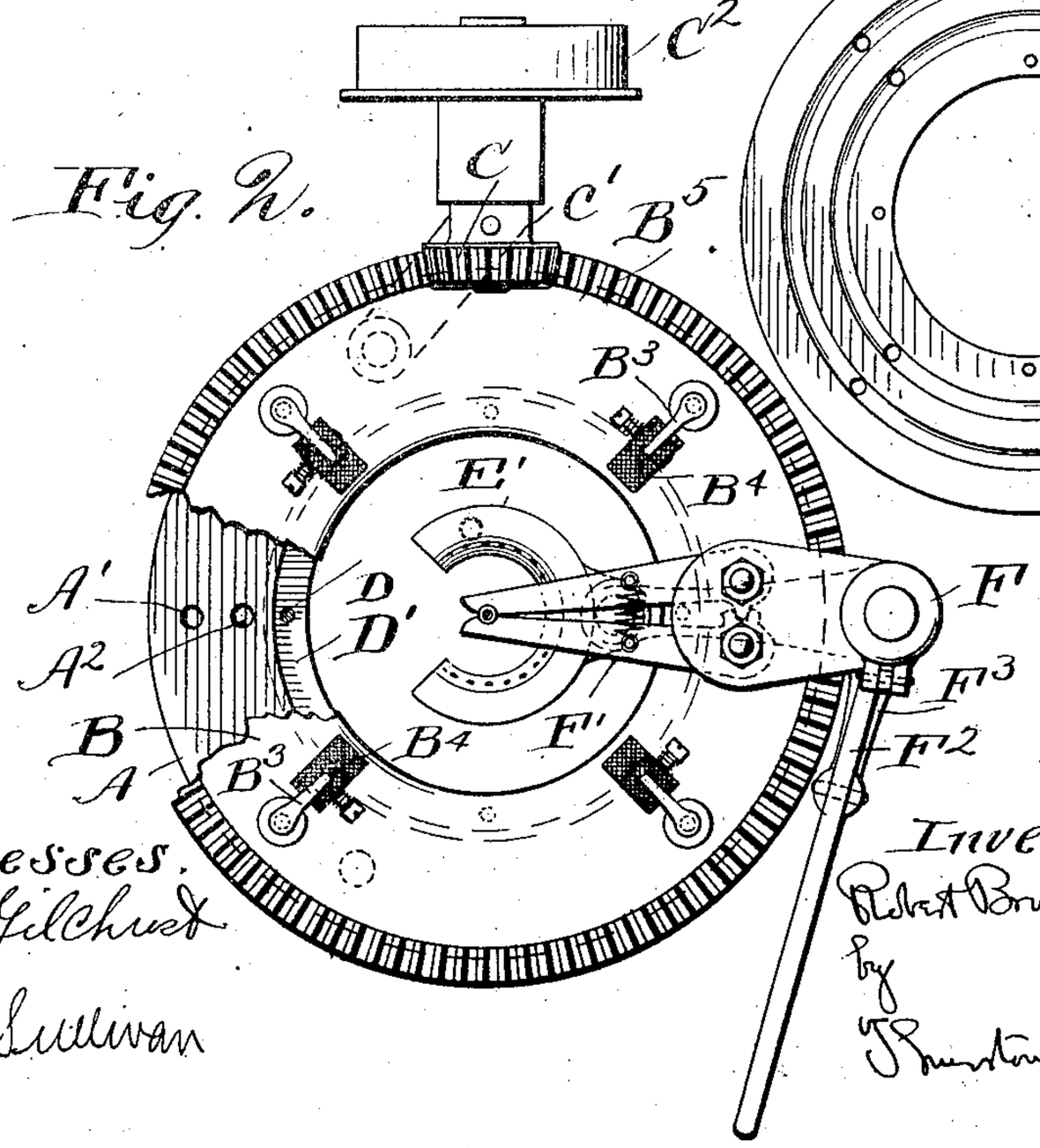


Fig. 2.



Witnesses.
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UNITED STATES PATENT OFFICE.

ROBERT BRUCE FLATHER, OF OAKLAND, CALIFORNIA, ASSIGNOR TO BRYAN-MARSH COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

ROTATING HEATING DEVICE FOR TUBULATING GLASS BULBS.

No. 842,191. Specification of Letters Patent. Patented Jan. 29, 1907.

Application filed April 21, 1906. Serial No. 312,944.

To all whom it may concern:

Be it known that I, ROBERT BRUCE FLATHER, a citizen of the United States, residing at Oakland, in the county of Alameda and State of California, have invented a certain new and useful Improvement in Rotating Heating Devices for Tubulating Glass Bulbs, of which the following is a full, clear, and exact description.

The object of the present invention is to provide improved mechanism for heating glass tubes uniformly, which mechanism is particularly applicable to heating such tubes while they are being applied to the bulbs of incandescent lamps to serve as exhaust-tubes.

The purpose of this mechanism is to provide means whereby heat may be applied uniformly to the tube at the lower extremity and in the zone where the attenuation is produced after the tube has been joined to the bulb. The same end has been attained heretofore by the operator directing heating-flames upon the tube by means of a hand-burner, which was manipulated about the tube in such positions as to apply the flames as nearly as possible to all sides alike. Such a method, however, has not been found to be satisfactory, since it is impossible to always focus the heating-flame by hand directly upon the proper spot when the burner is subject to constant movement, and, further, the movement of the burner about the tube for the purpose of applying the heat to all sides is not easily effected without one side cooling while the other side is being heated. This is not only undesirable for the purpose of forming a satisfactory joint when the tube is applied to the bulb, but, as is well known to those skilled in the art, an uneven heat at the zone of attenuation always results in the tube caving upon the softest side as it is being drawn out. For the purpose of remedying these defects I have devised a mechanically-operated means by which the heat may be applied uniformly to a tube as desired and applied to all sides alike without permitting any portion thereof to become cool.

Referring to the drawings, which illustrate one form of my invention, Figure 1 is a side elevation, partly in section, showing the rotatable device for applying the flames. Fig. 2 is a plan view of the same, partly broken away to show the supporting-plate, through which the air and gas connections to the rotatable flame-plate are made. Fig. 3 is a bottom plan view of the rotating flame-plate.

The supporting or bed plate A for the device is carried by a standard A^3 or by any other suitable means and has in the form shown a flat machined upper surface. Mounted upon this upper surface is the flame-plate B, which is channeled on its under face with continuous concentric grooves B' B^2. These grooves are positioned to ride over two ports A' A^2 in the supporting-plate, which are connected with air and gas supplies, which thus maintain a constant supply of air and gas to the grooves. Carried by the upper face of the flame-plate are blowpipes B^3 and gas-burners B^4, the burners connected with the inner or gas groove B^2 and the blowpipes connected with the outer or air groove B' before mentioned. On the outer periphery of said flame-plate are rack-teeth B^5, engaged by a pinion C, mounted on a short shaft C', which is rotated by a power-wheel C^2 or other device in any preferred manner. In order to secure a gas-tight contact during rotation, the flame-plate A is held against the bed-plate B by means of bolts D secured thereto and passing through a rotating ring D', which bears against the under face of the bed-plate, as shown in Fig. 1, and I prefer to insert springs D^2 between the head of the bolts D and the said ring D' in order that the proper frictional pressure may be secured without causing the mechanism to bind. The burners and blowpipes are so arranged as to direct the flames inwardly and concentrate them about the axis of their plane of rotation.

Mounted upon a standard E adjacent to the revolving flame-plate is an adjustable rest E' in the form of a horseshoe, against the lower face of which the upper side of a bulb is held during the tubulating operation. This rest may be hollow and provided upon its upper face with small openings in order that air connection may be established to apply small cooling-jets about the tubulating zone, if desired. Also carried by the standard E is a sliding sleeve F, supporting a pair of pivoted spring-pressed interlocked

jaws F′, by which the tube is held. The sleeve is capable of vertical reciprocation through means of the hand-lever F^2, fulcrumed on a fixed supporting-bracket F^3.

By the above arrangement it will be evident that the flame-plate can be kept in a state of constant rotation, the rate of speed of rotation being quite under the control of the operator, who has only to adjust the driving mechanism to conform with the requirements of the case. Thus when the flames are once properly directed and adjusted so they focus upon a tube held in the clamping-jaws there will be no variation between the amount of heat applied to one side and that applied to another and the tube will be continuously and constantly heated on all sides without any danger of becoming cool through reason of the burner being applied to one side only, as in the former hand-operated devices.

The tube can be lowered into the focal point of the flames and manipulated up and down by means of the hand-lever until it is thoroughly heated about the end. Upon the bulb being then placed in the rest the tube may be lowered until its fused end attaches itself to the apex of the bulb. Thereupon the operator elevates the clamp somewhat, drawing out an attenuating tube at the portion where it has been softened, reducing the interior diameter to a degree suitable for the subsequent exhaustion of the bulb and formation of the tip. The bulb may now be withdrawn downward, carrying the tube with it until the latter slips out of the clamp-jaws, and the operation may be again begun with another tube and bulb.

Having thus described my invention, I claim—

1. Mechanism for securing an even application of heat to tubes, comprising means for maintaining a tube in a given axial alinement and means for rotating a burner concentrically thereabout.

2. Means for securing an even application of heat to tubes, comprising means for holding a tube in a given axial alinement, a support carrying a plurality of burners and connections whereby it may be mechanically rotated, and means for maintaining a constant supply of gas to said burner during rotation.

3. In combination a bed-plate, a flame-plate mounted thereagainst, a gas-duct between the faces of said plate, a burner carried by the flame-plate and connected with the gas-duct, means for rotating the flame-plate so that the burners shall move in a circle about a given axis, and means for holding a tube in alinement with said axis.

4. In combination, means for holding a tube in a given axial alinement, a bed-plate, a flame-plate bearing on said bed-plate, a gas-duct between said plates, burners on said flame-plate communicating with said duct, means for rotating said flame-plate, and elastic means adapted to maintain close contact between the surfaces of said plates.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

ROBERT BRUCE FLATHER.

Witnesses:

J. A. VANDEGRIFT,

W. G. SEAL.