R. W. BAKER.

APPARATUS FOR THE MANUFACTURE OF INCANDESCENT LAMP FILAMENTS AND HEATERS.

APPLICATION FILED AUG. 23, 1911.

1,040,116.

Patented Oct. 1, 1912.

2 SHEETS—SHEET 1.

Fig. 2.

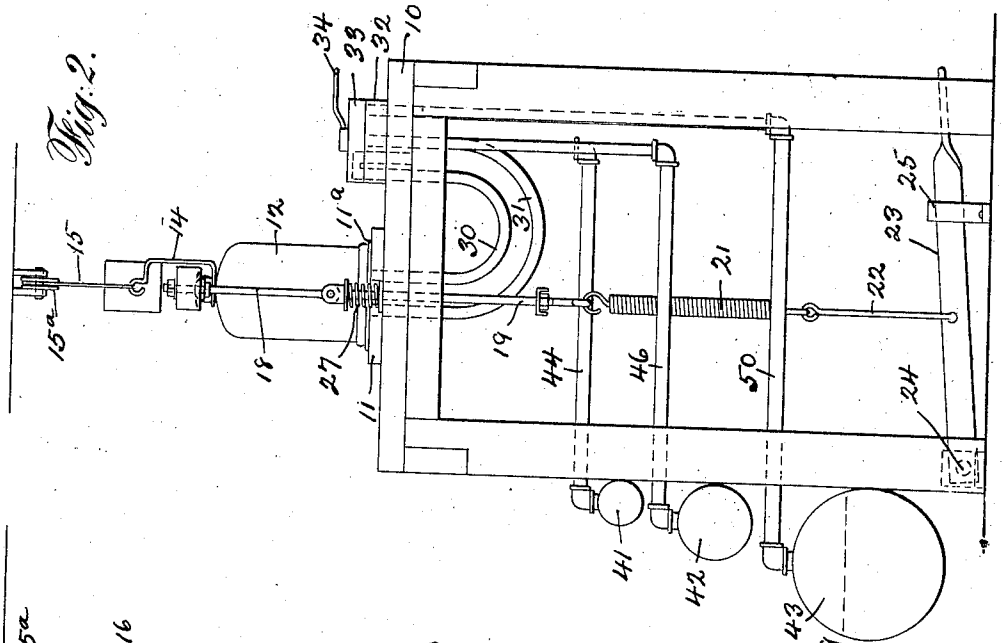
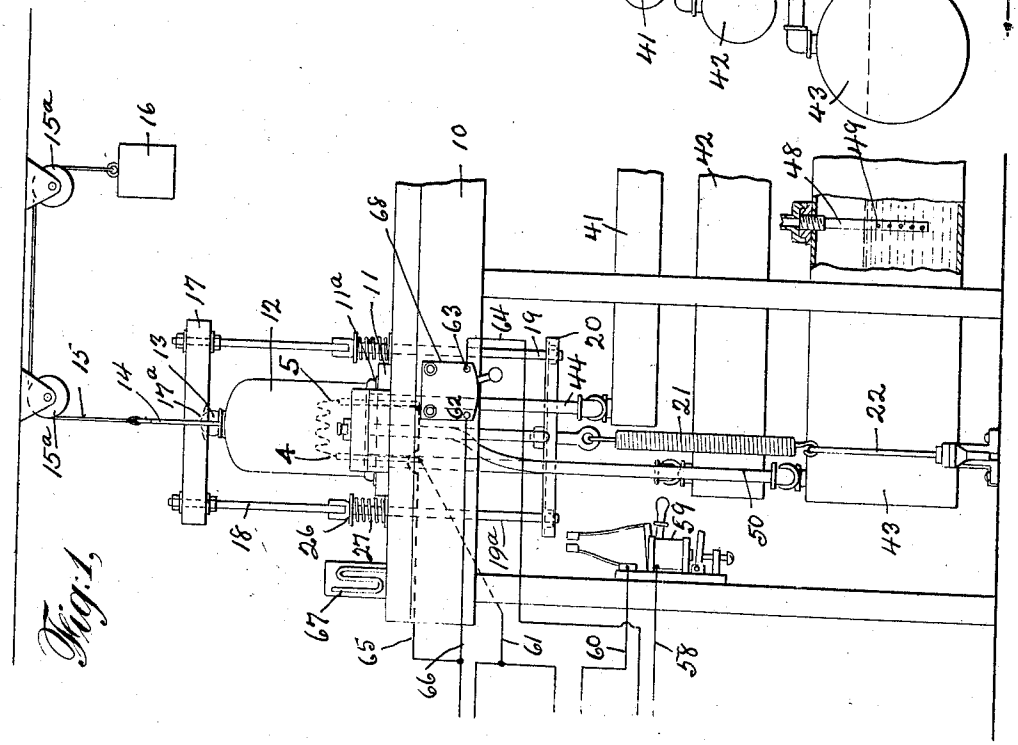


Fig. 1.



Witnesses:
Max B. A. Doring
Arthur L. Daniell,

Raymond W. Baker, Inventor,
By his Attorney
W. B. Hutchinson.

R. W. BAKER.

APPARATUS FOR THE MANUFACTURE OF INCANDESCENT LAMP FILAMENTS AND HEATERS.

APPLICATION FILED AUG. 23, 1911.

1,040,116.

Patented Oct. 1, 1912.

2 SHEETS—SHEET 2.

Fig. 3.

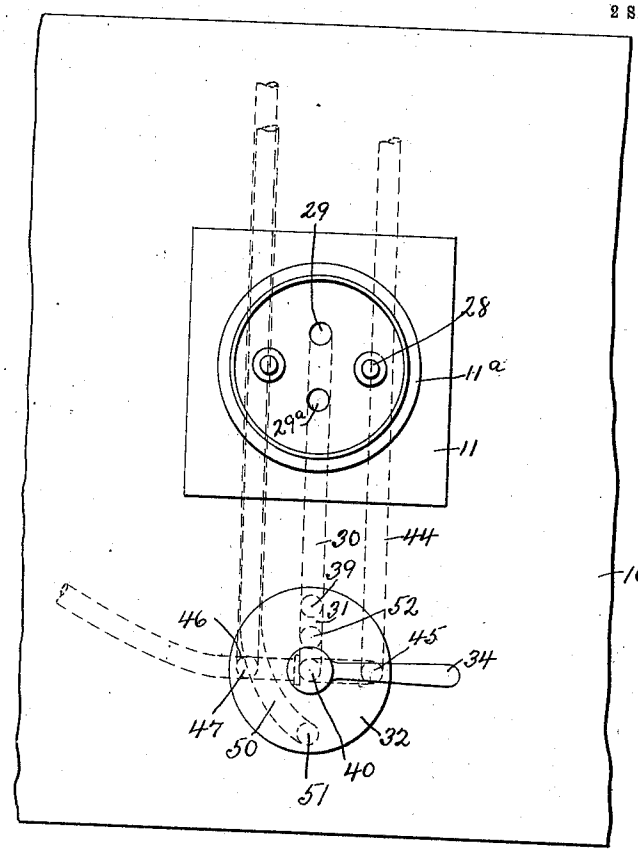


Fig. 4.

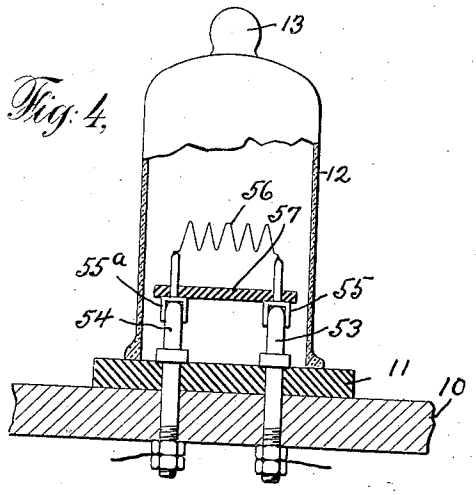


Fig. 5.

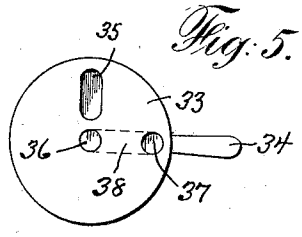
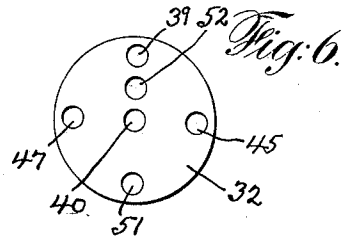


Fig. 6.



Witnesses:
Max B. A. Doring.
Arthur G. Dannell,

Raymor d W. Baker. Inventor
By his Attorney
W. B. Hutchinson.

UNITED STATES PATENT OFFICE.

RAYMOND W. BAKER, OF NEW YORK, N. Y., ASSIGNOR TO PARKER-CLARK ELECTRIC COMPANY, OF NEWARK, NEW JERSEY, A CORPORATION OF NEW JERSEY.

APPARATUS FOR THE MANUFACTURE OF INCANDESCENT LAMP FILAMENTS AND HEATERS.

1,040,116. Specification of Letters Patent. Patented Oct. 1, 1912.

Application filed August 23, 1911. Serial No. 645,893.

To all whom it may concern:

Be it known that I, RAYMOND W. BAKER, of the city, county, and State of New York, have invented a new and useful Improvement in Apparatus for the Manufacture of Incandescent Lamp Filaments and Heaters, of which the following is a full, clear, and exact description.

My invention relates to improvements in an apparatus for the treatment or manufacture of filaments or heaters, in the process or manufacture of which the core or base is treated by flashing it in an atmosphere containing gases so that one of the gases is decomposed and a deposit formed on the core or base. A difficulty in carrying in effect successfully such treatment is that it is almost impossible to get a uniform product, and one of the objects of my invention is to provide an apparatus in which a filament may be flashed, and when the process of the building up of the core or base has reached a certain predetermined point, the electric current will be automatically cut off and the treatment of the filament stopped.

Another object of my invention is to provide means for producing a vacuum in the flashing jar to admit the required gases, and after the process of flashing is completed, admitting air and exhausting the gases in the jar.

Another object of my invention is to provide a simple and effective means for supporting the jar and clamping it in place, and also a simple and effective means for supporting a filament during the process of flashing.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar reference characters indicate corresponding parts in all the views.

Figure 1 is a front view of the apparatus embodying my invention. Fig. 2 is a side view of the same. Fig. 3 is a top view of the base of the flashing jar and valve. Fig. 4 is a sectional side view of the flashing jar. Fig. 5 is a bottom view of the top plate of the valve, and Fig. 6 is a top view of the lower plate of the valve.

In the drawings I have shown the apparatus mounted upon a table 10, on the top of which is secured a block 11 of stone or any other convenient insulating material. The flashing jar or bell 12 in which the filament is flashed when the apparatus is in operation, is clamped to the block 11, and in order that the connection may be air tight I provide a rubber gasket 11^a which fits between the lower edge of the jar and the upper surface of the block or base 11. The top of the jar 12 has a boss 13 to which is secured a bent rod 14 as shown in Fig. 2, and this rod 14 is connected by a cord 15 which passes over pulleys 15^a and supports the counter-weight 16. To clamp the jar in place I provide a yoke which consists of a bar 17 and rods 18, the rods 18 being pivotally connected at their lower ends to the rods 19 which are supported on the table and extend down through the top of the table 10 and support at their lower ends a bar 20. This bar 20 is in turn connected by the spring 21 and rod 22 to the treadle 23 which is supported on one leg of the table at 24, and has a catch 25 to hold it in place when pushed down. The rods 19 and 19^a have near their upper ends collars 26, and support between these collars and the top of the table 10 spiral springs 27. These springs are of sufficient strength to overcome the weight of the yoke and the rods 19 and 19^a and the spring 21 so that the bar 17 will be raised when the treadle 23 is released from the catch 25. The bar 17 has on its lower surface a recess 17^a which is adapted to fit over the boss 13 on the jar 12, and thus when the treadle is pushed down the bell is clamped firmly against the base or block 11. It is apparent that when the treadle 23 is released the yoke will be raised by the springs 27, at which time the bar 17 and the rods 18 forming the yoke may be swung to one side allowing the bell to be raised and supported in position by the counter-weight 16.

The block or base 11 for the flashing jar is secured to the top of the table by bolts 28, and has extending through it two perforations 29 and 29^a through which perforations are led the pipes 30 and 31. These pipes 30 and 31 are connected at their outer ends to perforations in the lower plate 32 of a valve. This valve consists of two plates or disks 32 and 33 so arranged that the upper plate will turn or rotate upon the lower. For moving the upper plate I provide a handle 34. The upper plate 33 of the valve has on its lower surface an elongated re-

cess 35 and two holes 36 and 37 which do not extend through the plate, and which are connected at their inner ends by the duct 38 as shown in Fig. 5. The lower plate of the valve has perforations through which are led pipes as will be described. The pipe 30 above referred to leads from the perforation 29 in the block 11 to the perforation 39 in the lower plate of the valve 32, and the pipe 31 leads from the perforation 29 in the block 11 to the perforation 40 in the lower part of the valve 32.

Along the back of the table are supported the horizontal pipes 41, 42 and 43. The pipe 42 is connected with an exhaust fan, the exhaust fan not being shown in the drawings. A pipe 44 is connected with the pipe 41 and leads into the perforation 45 in the lower plate of the valve 32. The pipe 41 is a vacuum pipe, means for producing the vacuum in this pipe not being shown in the drawings. It is connected with the pipe 46 which leads into the perforation 47 in the base 32 of the valve. The pipe 43 is closed at both ends and forms a tank and contains the liquid or material which is used in treating the filaments. A pipe 48 leads into this tank 43 from a suitable gas supply tank which is not shown in the drawings, and this pipe 48 terminates at its inner end below the surface of the material in the tank 43 and has a number of perforations 49 so that the gas may bubble through the material in the tank and in this way vaporize or carry with it some of the material in the tank 43 up to the flashing jar. A pipe 50 is connected to the tank 43 and leads into the perforation 51 in the base 32 of the valve. The perforation 52 in the base 32 of the valve is left open to the air on the lower surface of the base.

The operation of the valve above referred to is as follows. When the valve is in what may be termed position 1, the hole 36 in the upper plate 33 registers with the perforation 40 in the lower plate 32, and the hole 37 in plate 33 registers with the perforation 45 in the lower plate, and the recess 35 will aline with the perforation 51. The result will be that the jar will be connected by the pipe 31, the perforation 40, the hole 36, duct 38, the hole 37, perforation 45 and pipe 44 to the vacuum pipe 41, and the air in the flashing jar 12 exhausted and a vacuum produced therein. When the valve is moved by rotating the upper plate into what may be termed the second position, the holes 36 and 37 in the top plate 33 will aline with the perforations 40 and 51 respectively in the lower plate of the valve, and the gas from the tank 43 allowed to flow through the pipe 50 through the valve as shown in this position and through the pipe 31 to the jar 12. When the valve is moved into what may be termed the third position, which occurs when the plate 33 is further rotated, the holes 36 and 37 in the top plate 33 will aline with the perforations 47 and 40 respectively in the lower plate 32, and a passage opened through the perforation 39 to the perforation 52 through the recess 35 in the top plate 33 of the valve. This connects the perforation 52 which is open to the air with the jar 12 through the pipe 30, and connects the jar through the pipe 31 and the valve and pipe 44 to the exhaust pipe 41, thus allowing air to flow into the jar and exhausting the air and gases from the jar 12. When the valve is moved by further rotating the top plate 33 and into what may be termed a fourth position, the holes 36 and 37 in the plate 33 aline with the perforations 40 and 39 respectively in the lower plate, and the recess 35 alines only with the perforation 45, and as the perforations 40 and 39 are both connected by pipes 44 and 46 to the jar 12, all connection between the jar and the exhaust pipe, the vacuum pipe and the gas pipe, is cut off and the jar 12 can be raised as above described.

For supporting the filament in the flashing jar 12 I provide conducting rods 53 and 54 which extend up through the top of the table and the block 11 as shown in Fig. 4. These rods 53 and 54 support the clips 55 and 55ª to which clips is secured the filament 56. The clips 55 and 55ª are supported and spaced apart by a bar 57 of non-conducting material. When a filament is to be flashed the clips 55 and 55ª which are held apart by the bar 57 are pushed down over the ends of the terminals 53 and 54, and when the process of flashing is finished the filament can be easily removed and a new one with its supporting clips placed in position.

For flashing the filament 56 I provide the following electric connections with the rods 53 and 54. The electric current is led in through the supply wire 58 through a circuit breaker 59, then through the wire 60 to an ammeter which is not shown in the drawing, thence through a wire 61 to the rod or terminal 54, thence through the filament to the rod 53 out through the terminal 62 in the rheostat 68 to the terminal 63 in the rheostat, and then out through the wire 64 in the main line. The connecting rod or terminal 55 is connected by the wire 65 to a voltmeter not shown in the drawings, and the terminal 62 of the rheostat 68 is connected by a wire 66 to the same voltmeter. In the drawings I have shown at 67 a vacuum gage which may be connected to either the pipe 30 or pipe 31 to show the pressure of the gases in the jar 12. The rheostat is provided in order that if desired the voltage of the current flowing through the circuit may be varied.

The operation of the apparatus is as follows. The filament is first inserted in place by slipping the clips 55 and 55ª over the ends of the terminals 53 and 54. The jar is then lowered, the yoke raised into position and clamped down by the treadle 23 thus holding the jar 12 in an air tight position against the block 11. It will be understood that while this is being done the valve is in the position designated above as position four, and in which all connection between the jar 12 and the exhaust pipe, the vacuum pipe, and the gas pipe is cut off. When the jar 12 is firmly clamped in position, the plate of the valve is then turned by the handle 34 into what has been termed position one, in which position the connections between the jar 12 and the pipes have been described, and in which the jar 12 and the vacuum pipe 41 are connected. In this way the air in the jar 12 will be exhausted. When this is accomplished the valve is turned into what has been described as position two, in which position the gases from the tank 43 are admitted to the jar 12. The electric current is then turned on, and the filament being heated receives a deposit from the gases in the jar. As the filament receives this deposit it is increased in size and permits a larger current of electricity to flow through it. This process of building up the filament by deposits from the gases is allowed to continue until a predetermined limit is reached, which is indicated by the amount of current flowing through it, at which point the circuit breaker releases and automatically cuts off the flow of the electric current and the treatment of the filament is finished.

Instead of leaving the valve at position two when the current is turned on, it may be moved to a position between position two and position three, in which case the jar will be cut off from the gas tank 43. This can be done when a higher pressure of gases in the jar 12 is desired, this increased pressure being due to the gas expansion resulting from the heat of the filament. After the treatment of the filament is finished and the current automatically cut off as above described, the valve is moved into what has been described as position three, which opens the jar to the air and connects it with the exhaust fan and the unused gases are withdrawn from the jar. When this is done the valve is moved into what has been termbd position four, in which as above described all connection between the jar 12 and the exhaust or vacuum pipes 41 and 42, and the gas tank 43 is cut off. In this position the treadle 23 may be raised, which will allow of the yoke which clamps the jar in position being raised and swung to one side, and permits the jar being raised and supported in position by the counter-weight 16, while the finished filament is removed and a new filament inserted and the process repeated.

It is to be understood that the voltmeter and ammeter are used only to set the apparatus at a predetermined point, at which point the circuit breaker 59 will automatically operate to cut off the flow of current and thus insure uniformity in the current carrying qualities of the filaments when finished.

It is apparent, therefore, from the above description that the apparatus embodying my invention provides for a very simple and easily operated means for producing a vacuum in a flashing jar, together with means for the admission of gases to the jar, and after the process of flashing is completed, ventilating the jar before it is raised for the removal of the completed filament. It is apparent also that absolute uniformity in the size and current carrying quality of the filament when finished is secured by the fact that when the current passing through the filament has reached a certain amount, the process is automatically stopped by cutting off the current. This also permits of one person operating several apparatuses at one time without any danger of letting the process of flashing continue for too great a length of time. While the apparatus as above described is primarily intended for the manufacture or treatment of filaments and heaters, it is apparent that it may be used for the treatment of any substance or body in which such substance or body is flashed and built up by the deposition of gases.

As it has been found in practice that it is necessary to maintain the gases admitted to the jar at a constant temperature, it will be apparent that by locating the gas tank just below and in close proximity to the flashing jar, there is very little chance for the gas being lowered in temperature before it reaches the jar, and as the connecting pipe is short, there is very little danger of the gases in the pipe attacking the walls of the pipe itself.

I claim:—

1. An apparatus of the kind described comprising a base plate, a flashing jar, a yoke pivotally supported to clamp the jar to the base plate, a filament support on the base plate, electric connections for the filament support, a circuit breaker in the electric connections to break the circuit when the current has reached a predetermined amount, and means for exhausting the jar and admitting gases thereto.

2. In an apparatus of the kind described the combination of a bell-jar, means of control operated by a single valve for producing a vacuum in the jar, for admitting gases to the jar, and for ventilating the jar and ad-

mitting air thereto, and means for flashing a filament in the jar.

3. In an apparatus of the kind described, the combination of a base plate, a bell-jar supported thereon, and a pivotally supported yoke to engage the top of the jar and clamp the jar against the base plate.

4. An apparatus of the kind described comprising a base plate, a flashing jar, a clamping device resiliently securing the flashing jar to the base plate, a filament support on the base plate, electrical connections for the filament support, a circuit breaker in the electric connections to break the circuit when the current has reached a predetermined amount, and means for exhausting the jar and admitting gases thereto.

5. An apparatus of the kind described comprising a base plate, a flashing jar, a clamping device resiliently securing the flashing jar to the base plate, a counter-balanced support for holding the flashing jar in an elevated position, a filament support on the base plate, electric connections for the filament support, a circuit breaker in the electric connections to break the circuit when the current has reached a predetermined amount, and means for exhausting the jar and admitting gases thereto.

6. An apparatus of the kind described comprising a flashing jar, means for flashing an article within the jar, a gas tank, a vacuum pipe, an exhaust pipe, and a single valve having ports therein to connect the said gas tank, vacuum pipe, and exhaust pipe severally with the flashing jar, and a port connecting the flashing jar with the air.

RAYMOND W. BAKER.

Witnesses:
WARREN B. HUTCHINSON,
THOMAS T. SEELYE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."