C. J. COLEMAN.

APPARATUS FOR SECURING GEMS TO ARBORS.

APPLICATION FILED NOV. 25, 1912.

1,168,710. Patented Jan. 18, 1916.

Fig. 1.

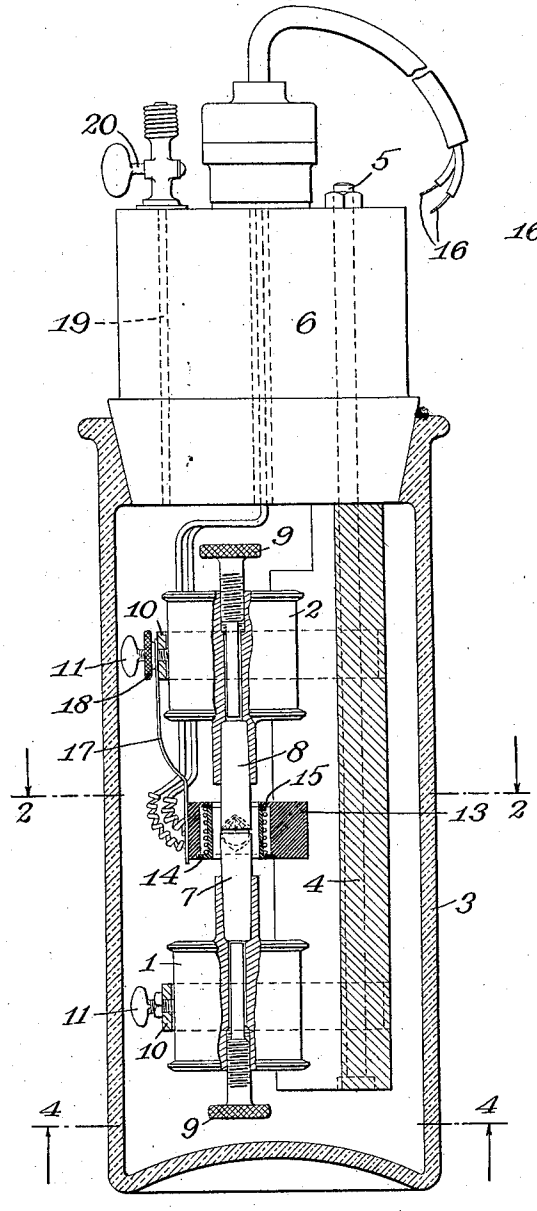


Fig. 2.

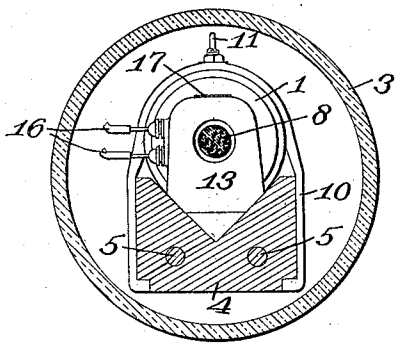


Fig. 3.

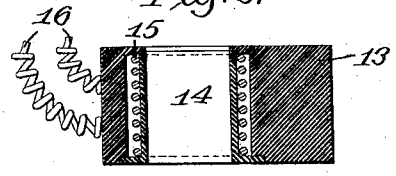


Fig. 4.

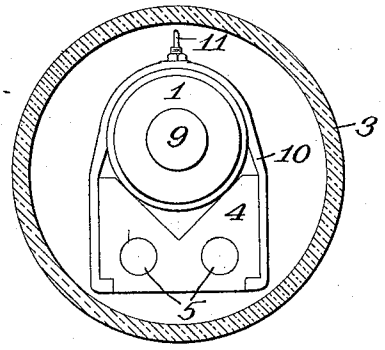
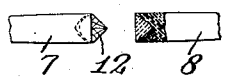


Fig. 5.



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UNITED STATES PATENT OFFICE.

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APPARATUS FOR SECURING GEMS TO ARBORS.

1,168,710. Specification of Letters Patent. Patented Jan. 18, 1916.

Application filed November 25, 1912. Serial No. 733,421.

To all whom it may concern:

Be it known that I, CLYDE J. COLEMAN, a citizen of the United States, residing at New Rochelle, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Apparatus for Securing Gems to Arbors, of which the following is a specification, reference being had therein to the accompanying drawings, forming part thereof.

My invention relates to the art of polishing diamonds and other gems, and particularly to apparatus for securing gems to arbors or holding means during or before the polishing operation.

In my co-pending application, Serial Number 733,417, filed on even date herewith, I have described and claimed an automatic machine for polishing gems in which the gem is cemented in the cupped end of a carbon arbor secured in the dop-holding head of the machine. In order that the gem may be presented to the lap to properly polish all the facets in a symmetrical arrangement about the geometric center of the gem, it is essential that the gem be arranged in the arbor in axial alinement therewith, and in my co-pending application, Serial Number 733,420, filed on even date herewith, I have described and claimed means for inserting a bruted gem in an arbor in axial alinement with the arbor. After the facets on the exposed portion of the gem on one side of the girdle have been polished, the gem is transferred to another arbor with the unpolished portion of the gem exposed, and then the facets are polished on that side of the girdle.

An object of my invention is to provide simple, reliable and convenient means for securing a gem in the arbor or holding means and transferring the gem to the second arbor or holding means in axial alinement therewith.

Other objects are compactness and durability of construction, and convenience and celerity of operation.

Still other objects and advantages of my invention will appear from the following description.

In carrying out my invention in one form, I provide two arbors arranged in alinement with their cupped ends adjacent and means for bringing them together along the common line and inserting the exposed portion of the gem into the socket of the second or receiving arbor, a suitable cement having previously been put into the socket, means being provided for applying sufficient heat to bake the cement, and then breaking off the first or holding arbor. Means are provided for excluding oxygen from the space surrounding the arbors when heat is applied in case the cement and arbors used would be oxidized under the baking heat.

More particularly, as means for carrying out my invention, I provide two arbor holders arranged to hold the arbors in axial alinement with their cupped ends adjacent, at least one of the holders being adjustable on a suitable guide support along the common axial line to insert the projecting portion of the gem into the cement-containing socket of the second or receiving arbor, and a source of heat adjacent the abutting ends sufficient to bake the cement. More specifically the source of heat is a small electric furnace also adjustable along the guide support. Still more specifically, the apparatus is contained in a receptacle from which an oxidizing atmosphere is excluded. Preferably the apparatus is all carried by the stopper of the receptacle to facilitate its removal.

Various other features and details of construction and combinations and arrangements of parts will hereinafter more fully appear.

I shall now describe the illustrated embodiment of my invention, and shall thereafter point out my invention in claims.

Figure 1 is a partial vertical central section and partial elevation of an apparatus embodying my invention. Fig. 2 is a horizontal section of the same on line 2—2, looking down, and turned 90° in a clockwise direction. Fig. 3 is an enlarged central vertical section of the electric furnace. Fig. 4 is a horizontal section of the parts shown in Fig. 1, on line 4—4, looking up and turned 90° in a clockwise direction. Fig. 5 is a detail, partially in section, of the adjacent ends of the two arbors in axial alinement, in their relative positions as they approach each other.

The arbor holders 1 and 2 are contained in a cylindrical receptacle 3 of glass or other vitreous material, and open at its upper end.

These arbor holders are slidably mounted in a vertical V-shape guide groove on a guide support 4, which is secured by bolts 5 to the stopper 6 of the receptacle 3 and extends downward into the receptacle. The arbor holders are cylindrical and have a concentric arbor-holding extension of reduced diameter provided with a tapered bore for the reception of the arbors, the arbor holder 1 being shown as holding the holding arbor 7 from which the gem is to be transferred, and the arbor holder 2 holding the receiving arbor 8 to which the gem is to be transferred. Each arbor is provided with an arbor-displacing screw 9, which extends axially through the arbor holder and is arranged to abut against the inner end of the arbor and loosen the arbor as the displacing screw is manually turned. To hold the arbor holders in the V-shape groove of the guide support 4, while permitting movement longitudinally of the guide groove, resilient tension straps 10 of general U-shape are provided which embrace the arbor holders and have their ends turned inward, as shown, to engage in grooves in the rear edges of the guide support 4. These tension straps are positively secured to the arbor holders by thumb screws 11.

The arbor holders 1 and 2 are arranged with the socket ends of the arbors adjacent as shown and with the arbors in axial alinement, and this axial alinement is maintained as the arbors are made to approach or recede from each other. It is, therefore, apparent that, since the gem 12 was originally arranged in axial alinement with the holding arbor 7, it is also in axial alinement with the receiving arbor 8, and as the two arbors are brought together, the projecting portion of the gem 12 on which the facets have been polished will enter the socket in the end of the receiving arbor 8, which socket has previously been filled with suitable cement.

To bake the cement and thus fasten the polished end of the gem 12 in the socket of the receiving arbor 8, a small electric furnace is provided also slidably mounted upon the guide support 4. This electric furnace comprises a block 13 of asbestos, wood, or other heat-insulating material, and a tube 14 of refractory material such as quartz, around which is wound a suitable electrical conductor 15, such as a coil of platinum wire. The lead wires 16 connected to the ends of this coil 15 enter through the stopper 6 as shown in Fig. 1. The block 13 is of general oblong shape in elevation, its two lower edges being beveled off, as shown in Fig. 2, to fit into the V-shape groove of the guide support 4, and a flat tension spring 17 is secured at one end on the tension strap 10 about the arbor holder 2 by the thumb screw 11 and a lock nut 18, and bears with its other end on the top of the block 13, and holds the electric furnace in the guide groove while permitting it to be adjusted longitudinally of the guide groove. The bore of the tube 14 is disposed in line with the arbors 7 and 8 so that the abutting ends of the arbor are adapted to enter the tube 14, as shown in Fig. 1.

It will be noted that all of the apparatus in the receptacle is carried by the stopper 6 and the parts may, therefore, be adjusted outside of the receptacle and inserted as a unit into the receptacle at the time that the receptacle is closed by inserting the stopper 6. To prevent the arbors from oxidizing when subject to the intense heat of the electric furnace, oxidizing atmosphere is excluded from the receptacle and this is preferably done by introducing a hydro-carbon gas such as illuminating gas into the receptacle through a conduit 19 in the stopper 6, admission to which is controlled by a cock 20. The displaced air may be allowed to escape by leaving the stopper 6 loose until the receptacle is filled with gas or in any other suitable way. To insure the absence of oxygen, the gas may be left turned on throughout the whole operation.

In operation the stopper 6 and the parts carried thereby are removed from the receptacle 3 and the arbors 7 and 8 are inserted in their respective arbor holders, and the arbors are then brought together until the projecting portion of the gem 12 enters the cement-containing socket in the arbor 8. The electric furnace is then adjusted so as to surround the abutting ends of the arbors, and the stopper is then inserted into the receptacle 3, after which the receptacle is filled with a non-oxidizing gas through the conduit 19. The electric circuit for the electric furnace is then closed and the cement in the socket of the arbor 8 is baked, after which the parts are taken out of the receptacle, the arbors removed from their holders and the arbor 7 is detached as by breaking it off from the gem 12. Any other suitable baking arrangement may be used within the broader aspect of my invention.

It is obvious that various other modifications may be made in the construction shown in the drawings and above particularly described within the principle and scope of my invention.

I claim:

1. Apparatus for securing gems in arbors comprising a suitable frame, arbor holding means carried thereby, gem holding means carried thereby and adapted to hold the gem in the cement containing end of the arbor in proper alinement with the arbor, and heating means for baking the cement while the gem is so held to secure the gem to the arbor.

2. Apparatus for securing gems in arbors comprising a suitable frame, arbor holding

means carried thereby, gem holding means carried thereby and adapted to hold the gem in the cement containing end of the arbor in proper alinement with the arbor, and heating means for baking the cement while the gem is so held to secure the gem to the arbor, and a container adapted to inclose said gem and cement in a non-oxidizing atmosphere.

3. Apparatus for transferring gems from one gem-holder to another, having in combination means for holding the gem-holders in axial alinement with the portion of the gem projecting from one inserted into the cement-containing socket of the other, and a source of heat adjacent the holders for baking the cement.

4. Apparatus for transferring gems from one gem-holder to another, having in combination means for holding the gem-holders in axial alinement with the portion of the gem projecting from one inserted into the cement-containing socket of the other, an electric furnace adjacent the holders for baking the cement, and a sealed container for the device, whereby the parts may be kept in a non-oxidizing atmosphere.

5. Means for transferring gems from one arbor to another comprising two arbor holders arranged to hold the arbors in axial alinement with their socket ends adjacent, one of the holders being movable toward and from its coöperative holder along the common axial line to insert the portion of the gem projecting from the first arbor into the cement-containing socket of the second arbor, and a source of heat at the juncture of the two arbors sufficient to bake the cement.

6. Means for transferring gems from one arbor to another comprising two arbor holders arranged to hold the arbors in axial alinement with their socket ends adjacent, a guide support for the arbor holders, one of the holders being adjustable on the guide support along the common axial line toward and from its coöperative holder to insert the portion of the gem projecting from the first arbor into the cement-containing socket of the second arbor, and an electric furnace mounted on the guide support and adjustable along the length thereof to bring it into proximity to the juncture of the two arbors to bake the cement.

7. Means for transferring gems from one arbor to another comprising a receptacle, a source of non-oxidizing atmosphere therefor, two arbor holders in the receptacle arranged to hold the arbors in axial alinement with their socket ends adjacent, a guide support for the arbor holders, the holders being adjustable on the guide support along the common axial line to insert the portion of the gem projecting from the first arbor into the cement-containing socket of the second arbor, and an electric furnace on the guide support and adjustable along the length thereof to bring it into proximity to the juncture of the two arbors to bake the cement.

8. Means for transferring gems from one arbor to another comprising a receptacle, a source of non-oxidizing atmosphere therefor, two arbor holders in the receptacle arranged to hold the arbors in axial alinement with their socket ends adjacent, a guide support for the arbor holders, the holders being adjustable on the guide support along the common axial line to insert the portion of the gem projecting from the first arbor into the cement-containing socket of the second arbor, and an electric furnace carried by the guide support comprising a block of heat-insulating material, a tube of refractory material extending through the block, and electric conducting wires on the tube, the electric furnace being disposed with the bore of the tube in alinement with the arbors and being adjustable along the guide support to surround the juncture of the two arbors to bake the cement.

9. Means for transferring gems from one arbor to another comprising a receptacle, a stopper for the receptacle, a conduit of non-oxidizing atmosphere for the receptacle entering through the stopper, two arbor holders in the receptacle arranged to hold the arbors in axial alinement with their socket ends adjacent, a guide support for the arbor holders carried by the stopper, the holders being adjustable on the guide support along the common axial line to insert the portion of the gem projecting from the first arbor into the cement-containing socket of the second arbor, an electric furnace on the guide support and adjustable along the length thereof to bring it into proximity to the juncture of the two arbors to bake the cement, and lead wires for the electric furnace entering through the stopper.

10. Means for transferring gems from one arbor to another comprising a receptacle, a stopper for the receptacle, a conduit of non-oxidizing atmosphere for the receptacle entering through the stopper, two arbor holders in the receptacle arranged to hold the arbors in axial alinement with their socket ends adjacent, a guide support for the arbor holders carried by the stopper, the holders being adjustable on the guide support along the common axial line to insert the portion of the gem projecting from the first arbor into the cement containing socket of the second arbor, and an electric furnace carried by the guide support comprising a block of heat-insulating material, a tube of refractory material extending through the block, and electric conducting wires on the tube, the electric fur-

nace being disposed with the bore of the tube in alinement with the arbors and being adjustable along the guide support to surround the juncture of the two arbors to bake the cement.

11. Apparatus for securing gems to arbors comprising a suitable frame, a gem holding arbor carried thereby, means for inserting a gem in a cement-containing socket in the arbor, and heating means for baking the cement to secure the gem to the arbor thereby.

12. Apparatus for securing gems to arbors comprising a suitable frame, a gem holding arbor carried thereby, means for inserting a gem in a cement-containing socket in the arbor, heating means for baking the cement to secure the gem to the arbor thereby, and a container for inclosing the gem and cement during the baking.

In testimony whereof I have affixed my signature in the presence of two witnesses.

CLYDE J. COLEMAN.

Witnesses:

VICTOR D. BORST,

WM. A. KELLY.

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