(No Model.)

T. A. EDISON.

MOLDS FOR CARBONIZING.

No. 287,522. Patented Oct. 30, 1883.

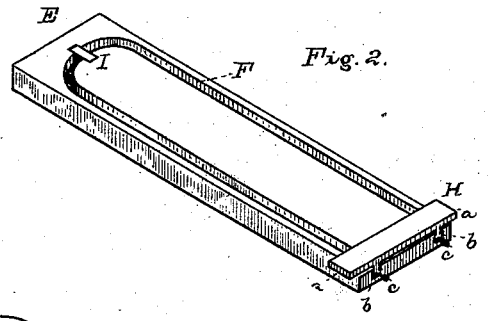


Fig. 2.

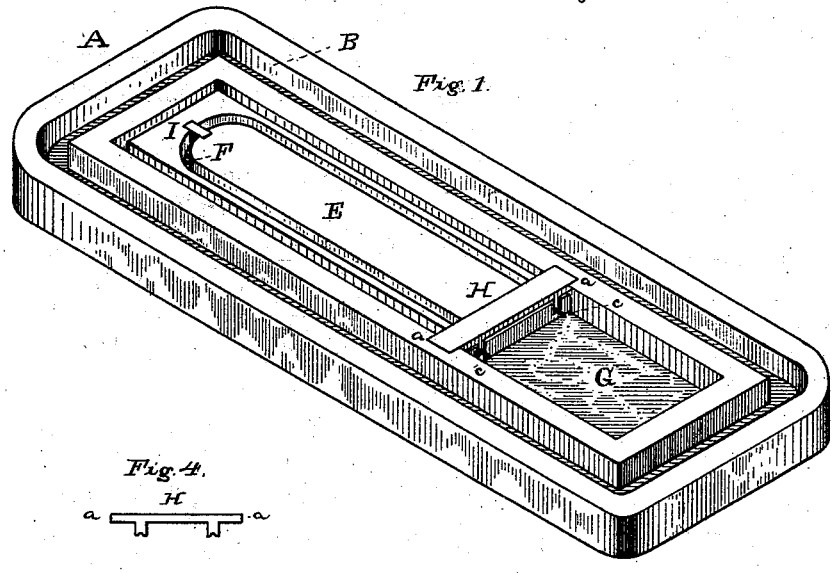
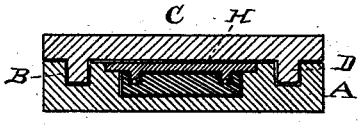


Fig. 1.

Fig. 4.

Fig. 3.



ATTEST:

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UNITED STATES PATENT OFFICE.

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MOLD FOR CARBONIZING.

SPECIFICATION forming part of Letters Patent No. 287,522, dated October 30, 1883.

Application filed March 16, 1883. (No model.)

To all whom it may concern:

Be it known that I, THOMAS A. EDISON, of Menlo Park, in the county of Middlesex and State of New Jersey, have invented a new and useful Improvement in Molds for Carbonizing, (Case No. 542,) of which the following is a specification.

My invention relates to molds for carbonizing the filaments which form, after carbonization, the incandescing conductors of electric lamps, my object being to keep the filament under strain during carbonization, while at the same time allowing contraction, the filament being so held and the strain being applied in such manner that the most delicate filaments will not be fractured or injured.

This invention is especially intended to be applied to the carbonization of very fine filaments, a number of which are to be twisted or braided together to form a single conductor.

Heretofore in molds of this character the filament has usually been placed in a chamber with movable blocks or weights set upon its ends, and its center held by either a fixed or movable block, so that either its limbs alone or its limbs and center were allowed to contract, or else one or both ends would be fixed and a movable weight placed in contact with the center, which weight would be drawn up as the filament contracted. These molds were not provided with covers; but a number of them were set one on top of another in a carbonizing-chamber. The disadvantages of these plans, where very delicate filaments are employed, are that the friction of the weights set on the ends of the filament would tend to injure such ends, and where a weight was placed in the center the filament would sometimes slip under such weight, in which case it would probably be broken; also, in both cases, the rubbing of the filament upon the bottom and sides of the mold with which it was in contact, as it contracted, would be injurious, and some parts of the filament being out of contact with the mold, the filament would be unequally heated. In addition, as no cover was provided for the mold, air would be admitted thereto, tending to oxidize the filament. By my present invention I overcome these defects by so constructing a mold that the filament, while allowed to contract and kept under constant strain, will be always in the same position relative to the parts of the mold in contact with it, so that it cannot rub against such parts, the strain is always even and constant upon every part of the filament, and every part is always in contact with the mold; and, in addition, the mold is so constructed that access of oxygen to the filament is as nearly as possible prevented.

In carrying out my invention the mold is made in two separate parts—an outer inclosing-chamber made air-tight, as nearly as possible, and a removable forming-plate, in which the filament is placed, which plate is set in the outer chamber, the ends of the filament being secured outside of the forming-plate. The forming-plate is preferably an oblong plate or block provided with a groove of the shape and length of the filament before carbonization, and the outer inclosing-chamber has a space in its center, into which said plate or block is set, such space being longer than said plate or block. The walls of said outer chamber should be of considerable thickness, and are preferably provided with a groove extending entirely around the top of said walls. Attached to the outer portion, and extending across the inner space, is a "bridge," of suitable material, having two downward projections, which enter the two sides of the grooves on the forming-plate. Each of said projections has an aperture in its lower end, through which apertures extend the ends of the filament. A closely-fitting cover is provided, having a flange extending around its lower side, which flange enters the groove in the top of the outer chamber of the mold. Preferably one or more strips are placed across the top of the groove in which the filament is laid, to prevent the filament from leaving such groove. All the parts are made of carbon, nickel, or other material capable of withstanding high temperatures.

My invention is illustrated in the annexed drawings, in which Figure 1 is a perspective view of the entire mold; Fig. 2, a similar view of the interior block or plate which holds the

filament; Fig. 3, a cross-section of the entire mold, and Fig. 4 an elevation of the bridge.

A is the outer chamber, provided with a groove, B, and C is the cover, having a flange or rib, D, which enters the groove B.

E is the inner plate or block, having a groove, F, for containing the filament. The block E is set into the space G, which is, as shown, considerably larger than said block E.

H is the bridge, having its ends *a a* set into slots or notches formed in A. The bridge H has two downward projections, *b b*, each of which has a slot or groove, *d*, in its lower end, and such projections both enter the groove F. The filament is laid in the groove F, with its ends *c c* projecting, as shown, beyond the bridge H. The filament shown being a very fine one, knots are tied in its ends to hold them; but with the ordinary filaments, each of which forms an entire conductor, the usual enlarged ends would answer this purpose. It is evident that as the filament contracts, its ends being held beyond the fixed bridge H, the plate A will be drawn along the space G, which is long enough to allow of the whole contraction of the filament. The filament is thus allowed to contract freely, though under a constant and even strain. Said filament of course does not move, remaining always in the same position relative to the groove which holds it, and consequently is not injured by rubbing against the sides of the groove. There is also no danger of its slipping under the weight, as there is when loose weights are employed. The strip I is set across the groove F, being held by notches made for the purpose. This prevents the filament from slipping out of the groove. The rib of the cover, fitting in the groove in the outer block, assists in preventing the access of air to the filament. A number of these molds are piled one on top of another in a suitable closed flask, which is placed in a carbonizing-furnace. After carbonization, the molds are taken from the flask, when by removing the bridge H and strip I the flexible carbon filament may be taken out.

What I claim is—

1. A mold for carbonizing filaments, wherein the filament is kept under strain and always in the same position relative to the parts with which it is in contact, while allowed to contract freely, substantially as set forth.

2. In a mold for carbonizing filaments, the combination of a movable grooved plate for containing the filament, means independent of said plate for holding the ends of the filament, and an inclosing-chamber, substantially as set forth.

3. In a mold for carbonizing filaments, the combination, with an inclosing-chamber, of the grooved plate for shaping the filament, said plate acting also as a weight to keep said filament under strain, substantially as set forth.

4. In a mold for carbonizing filaments, the combination, with the grooved plate for holding said filament, of means preventing the filament from leaving the groove, substantially as set forth.

5. In a mold for carbonizing filaments, the combination, with the plate for holding the filament, of the inclosing-chamber and the bridge attached to the latter for securing the ends of said filament, substantially as set forth.

6. A flat shallow mold for carbonizing filaments, provided with means for holding such filaments under strain and permitting contraction during carbonization, in combination with a cover constructed to exclude air, substantially as set forth.

7. A flat shallow mold for carbonizing filaments, provided with means for holding such filaments under strain and permitting contraction during carbonization, and having an edge groove, in combination with a cover provided with a corresponding rib, substantially as set forth.

This specification signed and witnessed this 17th day of February, 1883.

THOS. A. EDISON.

Witnesses:
H. W. SEELY,
EDWARD H. PYATT.