(No Model.)

H. ROBERTS.

ANNEALING POT FOR ANNEALING WIRE.

No. 275,522. Patented Apr. 10, 1883.

Fig: 1

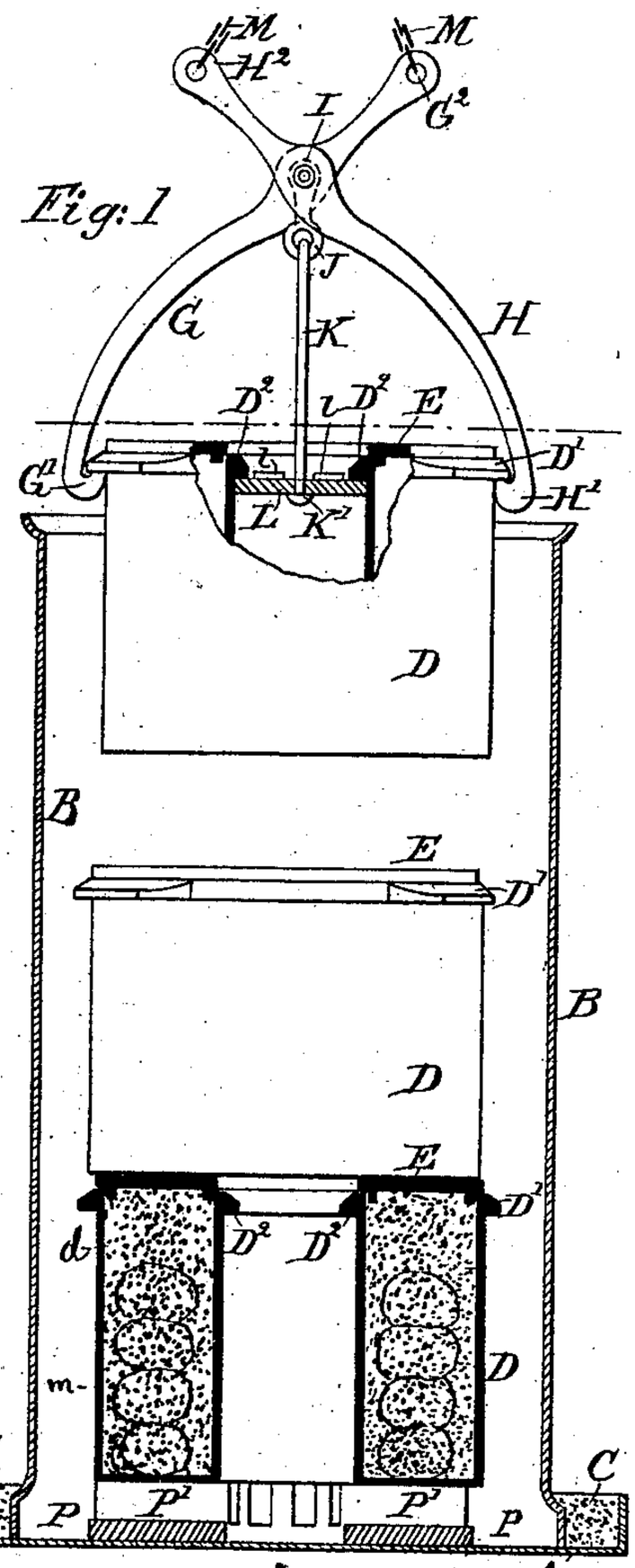
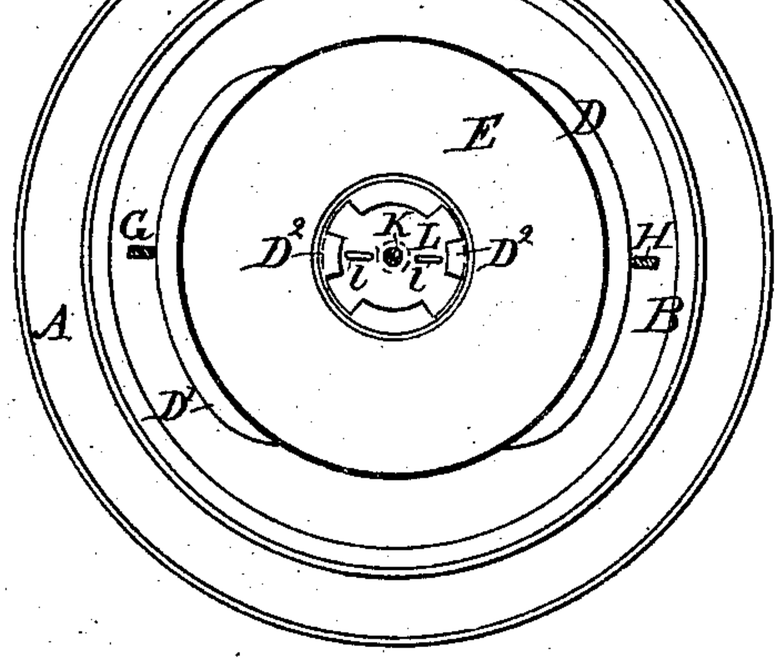


Fig: 3.

Fig: 2.



Witnesses:
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Inventor:
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UNITED STATES PATENT OFFICE.

HENRY ROBERTS, OF PITTSBURG, PENNSYLVANIA.

ANNEALING-POT FOR ANNEALING WIRE.

SPECIFICATION forming part of Letters Patent No. 275,522, dated April 10, 1883.

Application filed November 28, 1882. (No model.)

To all whom it may concern:

Be it known that I, HENRY ROBERTS, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Annealing-Pots for Annealing Wire; and I do hereby declare that the following is a full and exact description thereof.

In drawing wire each passage of the same through the more and more contracted holes in the dies induces a strained condition of the particles, which is manifest in great hardness and a tendency to brittleness. This increases at two or three successive drawings to such an extent that a further reduction of the wire without annealing would be impracticable. The annealing process, which is simply the subjection of the wire for a little time to a high temperature, preferably with the exclusion of air, changes the metal of the wire back to or near its original condition, and allows it to be again reduced by being drawn through successive smaller holes. The advantage of annealing is so great that it is frequently practiced before each reduction of the size. The annealing is usually conducted in pots of cast-iron or other material adapted to endure the heat and offering sufficient strength. I make annular annealing-pots of cast-iron, and introduce the wire coil therein, and cover with sand until the annular space is filled, and then pile them one upon another in suitable heated pits or kilns. The construction and arrangement is allowed by a support having radial passages for an active circulation of hot gases or flames through the interiors of the annular pots. Cast-iron covers, as also flanges and lugs at the top, allow for the several annular pots in a tier being placed somewhat irregularly. Covering the wire-coils with sand is found to be a convenient and efficient means of protecting the wire from exposure to the air, and consequently from oxidation.

The accompanying drawings form a part of this specification, and represent what I consider the best means of carrying out the invention.

Figure 1 is an elevation partly in section, showing two of my annealing-pots standing one upon another and a third suspended, in the act of being added to or removed from a series. Fig. 2 is a horizontal section on the line *s s* in Fig. 1. Fig. 3 is a plan view of the stand which supports the annealing-pot or tier of pots.

Similar letters of reference indicate like portions in all the figures.

A is a shallow pan. B is a hollow cylinder, open at each end and slightly flanged at the top and bottom. These parts may be of boiler-iron. They are applied together in the position shown in Fig. 1.

C is a seal of sand filling the annular space in the pan A exterior to the base of the hollow cylinder B.

D is one of my annealing-pots, partly filled with coils of wire, *m*, thoroughly covered with sand. Certain portions of the annealing-pots are indicated by additional marks, as D′ D^2, when necessary. D′ D′ are external partial flanges, partially on two opposite sides. D^2 D^2 are lugs extending inward toward the center. Any lifting force applied to the exterior flanges, D′ D′, lifts on the outer wall. Any lifting force applied on the lugs D^2 lifts on the inner wall. The softened condition of the metal, due to its high temperature, and the considerable weight to be lifted when loaded with wire and sand makes it important to distribute the lifting force very evenly.

E is an annular cover, adapted to match on the top and aid to receive any superincumbent weight imposed, and to distribute the strain over a considerable surface. It is also useful in increasing the protection of the wire against the access of air.

In engaging and lifting by my apparatus one of my annealing-pots, I open the tongs G H and turn the plate L into the position in which it will freely pass the lugs. Now the tongs, with the link J and its attached rod K, and plate L, are lowered in position over the annealing-pot, and the plate L is turned a quarter around into the position shown in Fig. 2, where it will, on being again lifted, engage with the lugs D^2. The tongs are now ready to close upon the exterior of the annealing-pot, and a lifting force being applied through the chains M the pot is lifted and may be moved to any required position. On lowering the pot the reverse of the above movement liberates the pot and allows the tongs and their attach-

ments to be lifted idly. In turning the plate L the entire tongs may, in many cases, be turned therewith; but when from any reason it is desirable to avoid this the plates L may alone be turned. Projections *l l* are formed on the upper face of the plate L to aid in turning, when required.

P P′ is a casting, of a diameter corresponding with that of the annealing-pots, which is placed centrally in the bottom of the kiln before lowering the first annealing-pot. It is composed of a plate, P, with radial ridges P′ on its upper surface, and liberal open spaces between them. The ridges P′ hold the bottom of the lowest annealing-pot up and allow the hot air of the kiln to flow freely inward and outward, which circulation it is desirable to maintain through the center of each annealing-pot. The current will usually be down through the center of the several annealing-pots and outward through the radial spaces between the ridges P′. The main protection of the wire against the access of air while at a high temperature during and after that annealing process is the sand with which the several annealing-pots are closely packed. This sand is marked *d*.

Modifications may be made in the forms and proportions of all the parts. Parts of the invention may be used with some success without the whole. I can modify the size and form of the pot within wide limits. I can employ more than two lugs, D^2, spaced equally apart by providing a correspondingly-formed plate, L, adapted to pass them freely in one position, and to engage them firmly in another position, as described. I have shown three annealing-pots in one cylinder, B, but the number may be greater or less. The pan A and cylinder B may be placed in any convenient position in the heated kiln not shown. The pan A and cylinder B may serve with or without a non-conducting exterior material, so may also the kiln in which the heat is developed by the decomposition of fuel or the introduction of incandescent gas.

The fact that the external flange, D′, extends only partially around the top of the annealing-pot, being entirely omitted at two opposite points, allows the tongs G H to be lowered into position without being opened but little. The partial turning of the tongs causes them to be received under the partial flanges, and then a slight closing will allow them to match to any inequalities in form due to imperfection in the manufacture or to subsequent warping. It is important to allow for a slight opening and shutting of the tongs; but I do not find it necessary to allow for any adjustment up and down.

I claim as my invention—

The annular annealing-pots D, with two partial flanges, D′ D′, on opposite points on the exterior, and two lugs, D^2 D^2, at opposite points on the interior, adapted to serve in combination with a lifting device, as G H K L, which will take hold both in the exterior and interior, and may be engaged and disengaged by a partial rotation, substantially as herein specified.

In testimony whereof I have hereunto set my hand at New York city, New York.

HENRY ROBERTS.

Witnesses:

A. E. FIRMIN,

A. H. GENTNER.