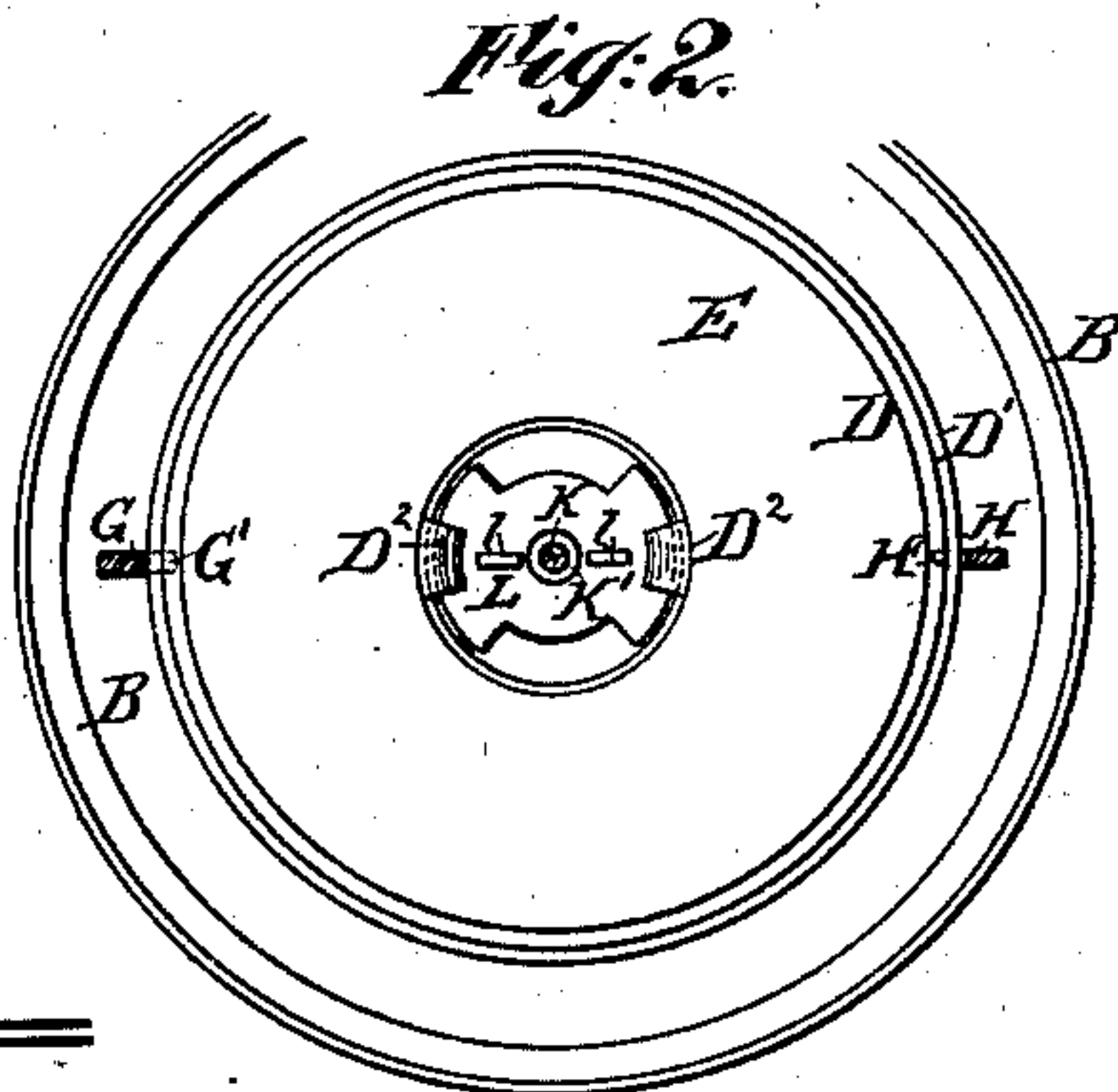
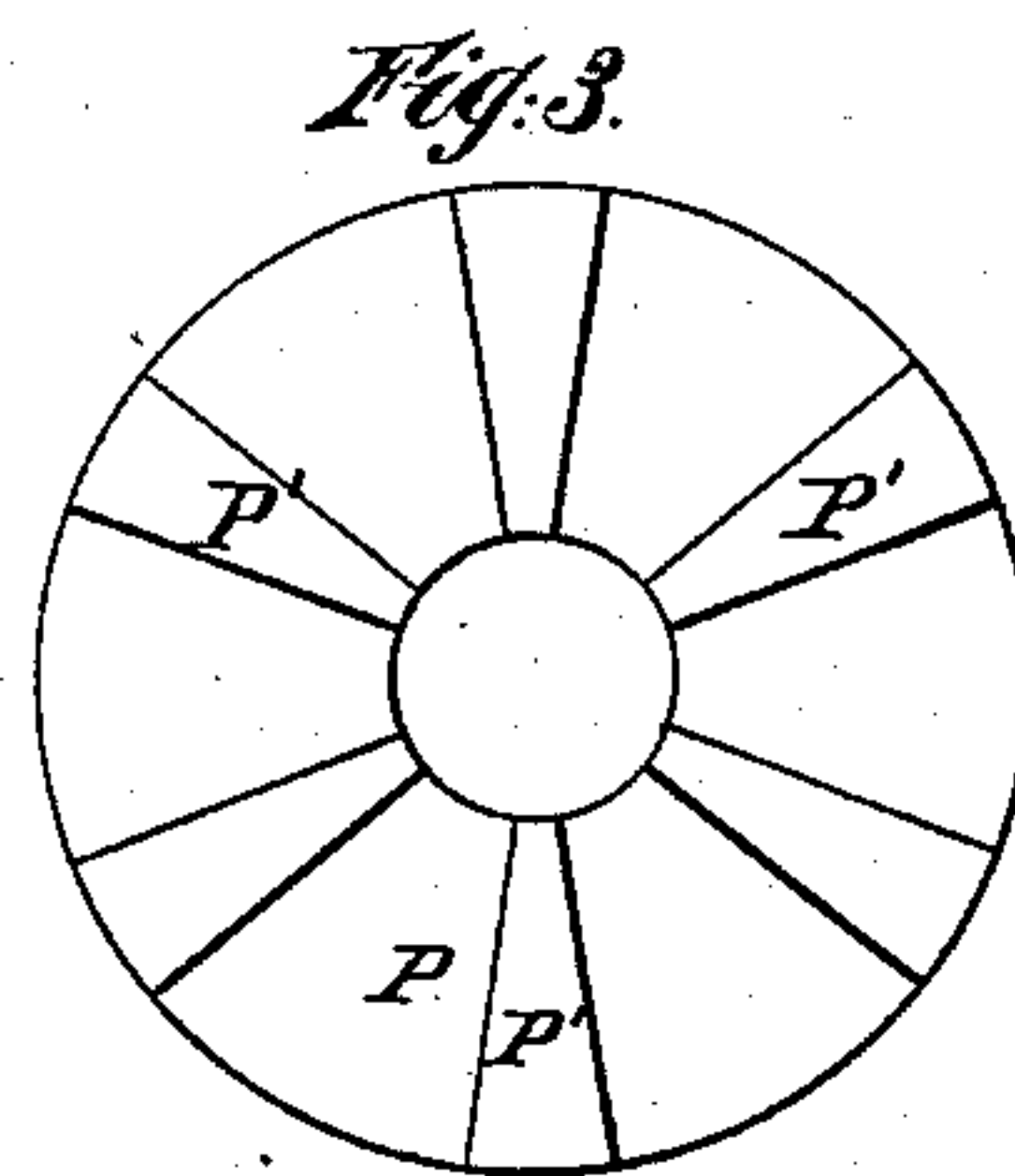
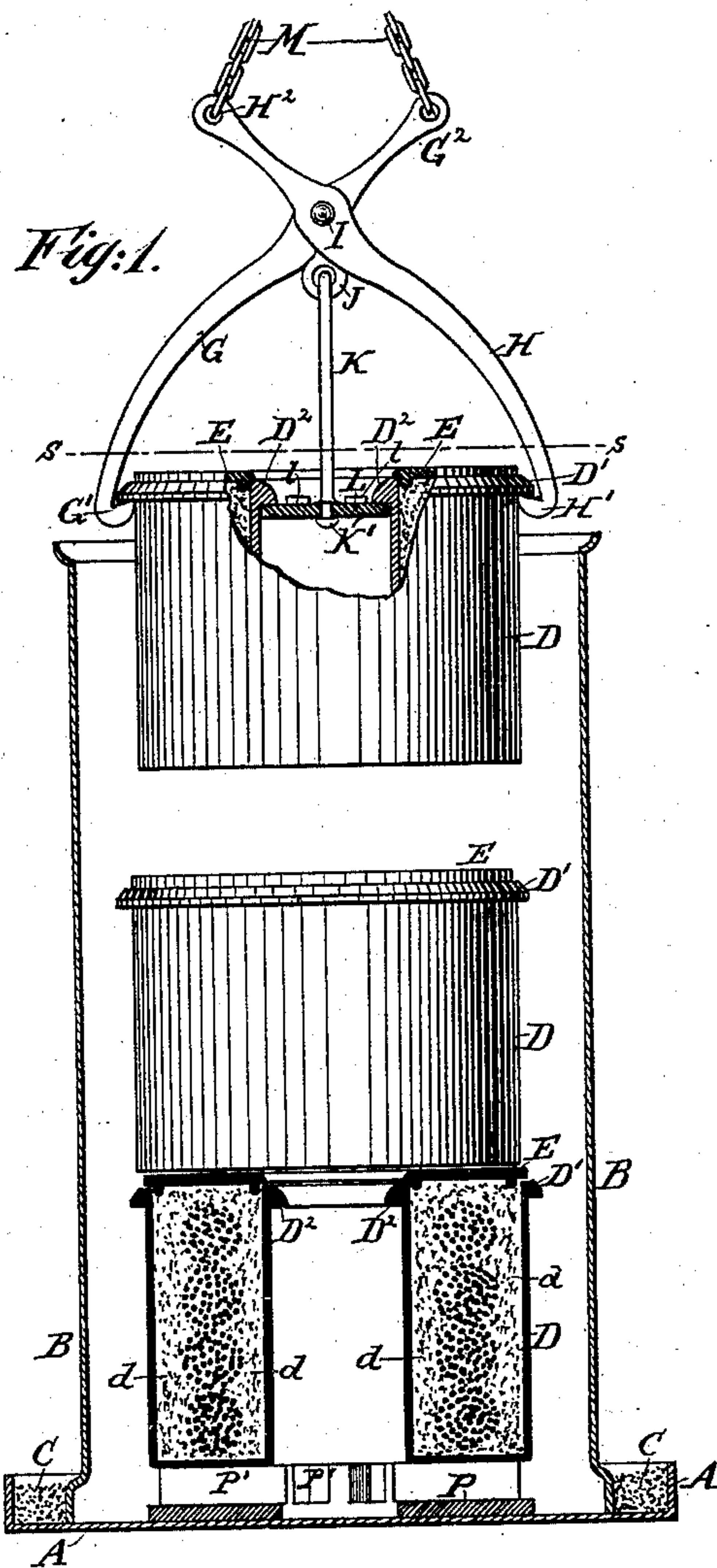


(No Model.)

H. ROBERTS.  
ANNEALING POT FOR WIRE.

No. 268,128.

Patented Nov. 28, 1882.



WITNESSES—  
Charles R. Seale.  
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INVENTOR—  
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by his attorney  
Thomas S. Stearns



# UNITED STATES PATENT OFFICE.

HENRY ROBERTS, OF PITTSBURG, PENNSYLVANIA.

## ANNEALING-POT FOR WIRE.

SPECIFICATION forming part of Letters Patent No. 268,128, dated November 28, 1882.

Application filed July 31, 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 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. 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. I make annular annealing-pots of cast-iron, with a projecting flange around the exterior of the top and two lugs projecting inward from the top opposite to each other. I employ these latter as means for conveniently engaging and disengaging the lifting device by which each annealing-pot and its load are successively lifted in being placed in the pit and being removed therefrom. I pile the annealing-pots one upon another in suitable heated pits. The construction affords facilities for the circulation of a current of heated air through the interiors of the pots, and the invention may be successful in a degree when only parts of the apparatus are employed.

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 parts in all the figures.

A is a shallow pan.

B is a hollow cylinder, open 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, certain portions being indicated by additional marks, as *D'* *D*<sup>2</sup>, when necessary.

*D'* is an external flange. It is continued quite around the top.

*D*<sup>2</sup> *D*<sup>2</sup> are lugs extending inward toward the center. Any lifting force applied to the exterior flange, *D'*, lifts on the outer wall. Any lifting force applied on the lugs *D*<sup>2</sup> 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.

G and H are corresponding parts of a grab or pair of tongs. They are connected by a pivot, I, and are similar each to the other. Certain parts will be designated, when necessary, by additional marks of reference, as *G'* *H'*. A short link, J, is attached to the pivot I, and to an eye in the lower end thereof is connected a short rod, K, the lower end of which forms a head, K'. Upon the rod K, above the head K', is mounted a turning-plate or broad swiveling-bar, L, which is capable of engaging under the lugs *D*<sup>2</sup> and exerting a strong lifting force thereon, or of being turned a quarter around and out of contact with said lugs. In



the latter position the plate L may be raised and lowered without effect. The lower ends of the tongs G H carry stout hooks G' H'. The upper ends of these parts have eyes G<sup>2</sup> H<sup>2</sup>. These eyes receive short chains, only partially represented, which unite at a point above and are connected to a suitable crane or apparatus for conveniently raising and lowering the tongs and any load which they may be supporting.

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, 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<sup>2</sup>. 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 movements liberates the pot and allows the tongs and their attachments 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 plate L may alone be turned. Projections *ll* 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 the annealing process is the sand with which the annular part of each annealing-pot is closely packed. This sand is marked *d*. The sand also, and obviously, aids to support

the coils of wire, and prevents their becoming distorted by yielding to gravity under the prolonged high temperature.

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. The portion of the tongs above the pivot I may be shortened. The extensions of the parts G and H above the pivot I may be dispensed with altogether, and the device may still be successfully used. I prefer the whole, as shown. I can modify the size and form of the pots within wide limits. I propose in some cases to provide other means for supporting the lowermost pot of each series at such a height as shall allow a free circulation of hot air or flame through the space within the annealing-pots. I can employ more than two lugs, D<sup>2</sup>, 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 sand packing and the method of annealing in annular vessels thus packed and arranged in tiers will be made the subject of a separate application for patent.

I claim as my invention—

1. The annealing-pot described, composed of the annular vessel D, having the external flange, D', and internal lugs, D<sup>2</sup>, and adapted to serve as and for the purposes herein specified.

2. The chain M, tongs G H, pivot I, headed rod K K', and plate L, in combination with the annealing-pot D D' D<sup>2</sup>, and adapted to serve therewith, as and for the purposes herein specified.

In testimony whereof I have hereunto set my hand, at New York, this 28th day of July, 1882, in the presence of two subscribing witnesses.

HENRY ROBERTS.

Witnesses:

THOMAS D. STETSON,  
A. E. FIRMIN.