

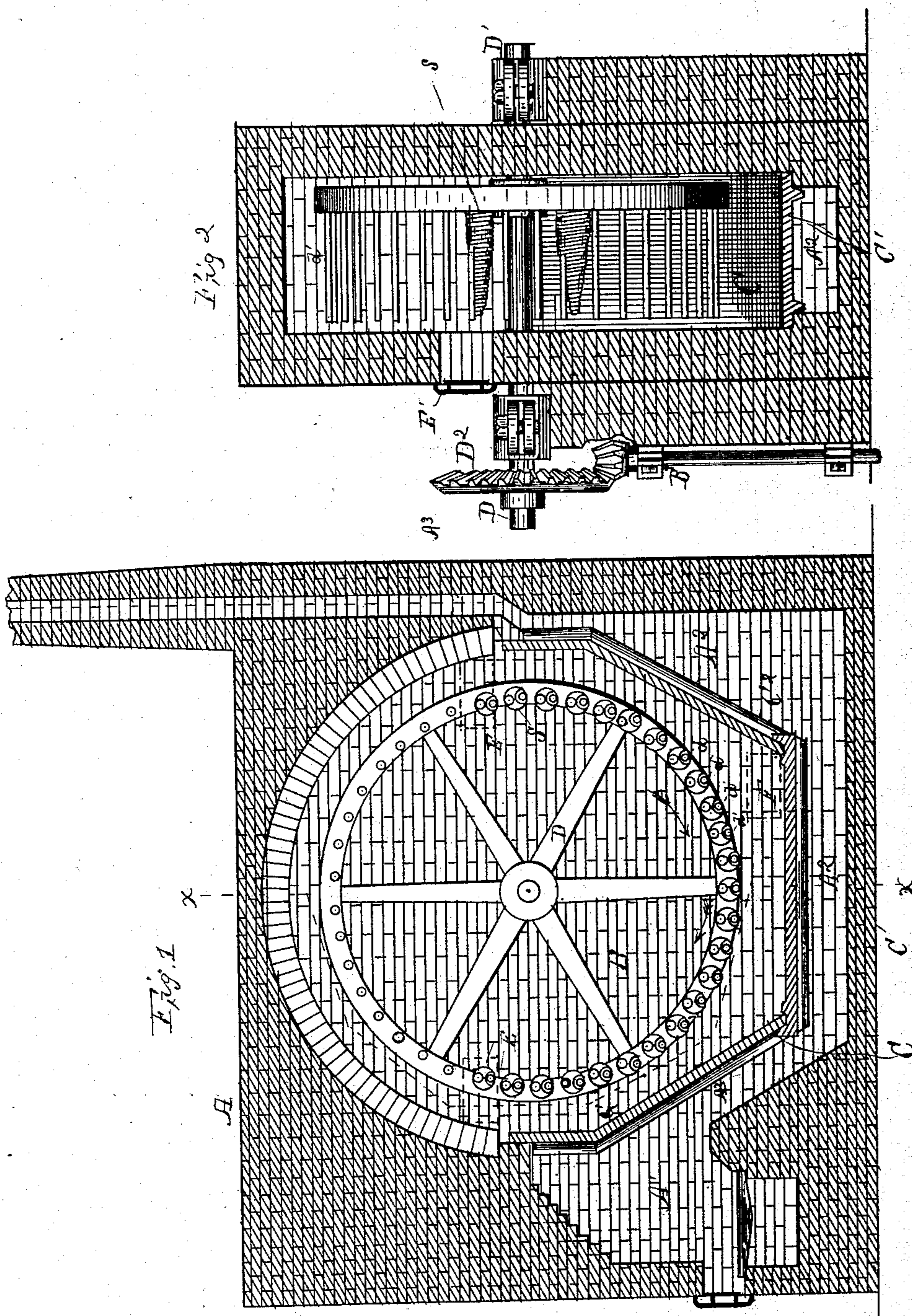
(No Model.)

M. N. LOVELL.

APPARATUS FOR TEMPERING WIRE SPRINGS.

No. 315,457.

Patented Apr. 7, 1885.



Witnesses.
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UNITED STATES PATENT OFFICE.

MELVIN NEWTON LOVELL, OF ERIE, PENNSYLVANIA, ASSIGNOR TO THE
LOVELL MANUFACTURING COMPANY, (LIMITED,) OF SAME PLACE.

APPARATUS FOR TEMPERING WIRE SPRINGS.

SPECIFICATION forming part of Letters Patent No. 315,457, dated April 7, 1885.

Application filed March 16, 1885. (No model.)

To all whom it may concern:

Be it known that I, MELVIN NEWTON LOVELL, a citizen of the United States, residing at Erie, in the county of Erie and State of Pennsylvania, have invented certain new and useful Improvements in Apparatus for Tempering Wire Springs; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The object of my invention is to provide an apparatus for tempering wire springs—such, for example, as furniture-springs—and also other articles, whether made of wire or not, in the manner described in my process application filed April 17, 1884, Serial No. 128,243, and for which no claim is made in this application.

My invention consists of constructions and combinations, all as will hereinafter be described in the specification and pointed out in the claims, reference being had to the accompanying drawings, in which—

Figure 1 represents a longitudinal vertical section through the oven and its furnace, and Fig. 2 a transverse vertical section through the same parts.

My apparatus consists of an oven which is so constructed that the plates on one side of it are much hotter than on the other side, and a revolving wheel within said oven conveys the articles to be tempered in front of said plates from the coolest to the hottest points, thus exposing the articles to a gradually-increasing temperature until they have become sufficiently heated. The oven is also provided with suitable openings for inserting the articles at the coolest point and withdrawing them at the hottest point.

A represents the masonry forming the oven and furnace; A', the combustion-chamber or fire-box; A², a diving-flue which passes around the under side of the oven; A³, the chimney-flue; B, the oven-chamber which is formed on top by an arch in the masonry, and on the bottom and sides by iron plates C, C', and C², which rest on a ledge in the masonry; D, the conveyer-wheel which is rotated in the oven in the direction indicated by an arrow thereon.

d d d are holes in the side of said wheel. *d' d'* are rods which are set into said holes and on which the articles to be tempered are hung. SS represent bed-springs nested together and hung on said rods. E and E', (shown in dotted lines, Fig. 1, as they are in the wall removed by the section,) are the openings through which the articles are admitted and removed from the oven. F is an opening with a door by which access may be had to the bottom of the oven, if required. This, too, is in the wall removed, and is shown in dotted lines; D', the shaft of the wheel D, and D² D³ the gearing by which the wheel is rotated. This device was designed and so far has only been used for tempering furniture-springs; but it is obvious that it need not be limited to that use, but may be employed for tempering almost any article that is made of light metal which will become thoroughly heated by the exposure here obtained. If the articles are not of such a form as to hang on the rods *d'*, they can be provided with means for hanging them on. In the drawings furniture-springs are shown as the articles being operated upon, and as the operation would be the same with any other article, I shall hereinafter only speak of springs. The fire as it is applied to the plates heats the plate C, which is next to and forms the back of the fire-box, the hottest. C', will not be so hot as C, and the plate C² will be still cooler. There will be several hundred degrees difference between the temperature of the plates C and C²; hence, of course, the oven will be cooler in the side next the plate C², and its hottest point will be directly opposite the fire-box. The springs are nested together, a dozen in each nest, and are strung on rod *d'*, which the attendant grasps with a pair of tongs and inserts it into the oven endwise through the door E on the right of Fig. 1, and sticks the end of the rod into one of the holes *d* in the wheel D. As will be seen by the arrow, the wheel rotates from the door E downward, and the springs are conveyed toward the hottest part of the oven. The wheel revolves slowly. I have generally had it revolve once in about twenty minutes; but its rapidity of movement should be made to depend upon the size of the wire used. If I were using a smaller wire for my springs than I am, (size 100

No. 10 $\frac{1}{2}$), I should revolve the wheel faster, and if a larger wire, slower. At the rate I have named it takes about thirteen minutes for the springs to pass from the door E down and up to the door E', where they are removed by the attendant grasping the rod d' with his tongs and drawing it out. The wheel moves so slowly that holes d can be placed quite close together, and the attendant who puts in will be able to place a rod in each hole, and the attendant who takes out will have no difficulty in removing all the rods as they come opposite the door E'. Thus it will be seen the work goes on continuously. The springs enter at the coolest point and are removed in a few minutes at the hottest point.

For furniture-springs I have found that I obtained the best results by keeping the fire so that the plate C is kept at a cherry-red heat. This gives about 1,200° Fahrenheit at the hottest point in the furnace, so that the springs are heated to nearly that temperature when they are removed.

It should be observed, for it is an essential feature, that the springs are so held by the wheel and the rods that each nest obtains precisely the same exposure to the heat that the others do.

I am aware that springs have been heated before in an oven by being conveyed by a conveyer-wheel, or, rather, an upright shaft with arms; but the furnace was below the oven and the springs which were placed on the lowest arms of the conveyer were heated more than those placed on the upper arms, and the springs when put in were exposed at once to the same degree of heat that they were exposed to during all their stay in the oven.

It is not necessary, to obtain the result I do, that the wheel and flues have the same positions as I show. The wheel might be made so as to revolve horizontally, and the flues made to pass around one side of the oven; but such

a change would gain nothing in effect, but would lose in convenience. The form I show is exceedingly convenient, and the flues are so disposed as to get the best application of the fire to the plates. When the springs have been removed from the oven, they are plunged at once into cold water or other cooling bath.

What I claim as new is—

1. The combination of a furnace having a fire box and flue, an oven having an inlet-opening at the end next to the flue, and an outlet-opening at the end next the fire-box, and a revolving wheel within said oven, substantially as described, whereby the articles to be tempered are admitted to the oven at the coolest point and taken out at the hottest, as set forth.

2. The combination of a furnace having a fire box and flue, an oven having walls formed of iron plates exposed to said fire-box and flue and provided with an inlet-opening next to the flue, and an outlet-opening next to the fire-box, and a revolving wheel mounted within said oven and geared to revolve from the coolest to the hottest plate, and having means for holding the articles to be tempered and convey them in front of said plates from the coolest to the hottest, for the purpose mentioned.

3. In an apparatus for tempering springs and other light articles, the combination within the masonry A, of the furnace A', flues A² and A³, oven B, having iron walls C C' C², and openings E and E', the conveyer-wheel D, mounted within said oven and geared to revolve from the plate-wall C² toward wall C, and having means, substantially as shown, for holding and carrying the springs or other articles.

In testimony whereof I affix my signature in presence of two witnesses.

MELVIN NEWTON LOVELL.

Witnesses:

M. F. HALLECK,
T. F. HOLDEN.