To all whom it may concern:

Be it known that I, JOHN JENKINS, a citizen of the United States of America, residing at No. 17 Goodrich street, Allegheny, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Annealing and Bluing Furnaces; and I do hereby declare the following to be full, clear, and exact description thereof, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to an improved annealing and bluing furnace for tin, ferne, or planishing plates; and it consists of a hot and cold chamber in which the sheets to be annealed are carried from one end of the furnace to the other through a muffle, by means of a series of rolls, the one geared to the other in a manner that will give a continuous even movement to the sheets during the annealing or bluing; and my invention also consists in the cold-rolling of the sheets after they have passed from the annealing or bluing, together with the certain details of construction and combination of parts, as will be fully described hereinafter.

In the accompanying drawings, Figure 1 is a side sectional elevation of my improved furnace and means for operating the same constructed and arranged in accordance with my invention. Fig. 2 is a top plan view of the same. Fig. 3 is an end sectional elevation through the hot chamber or annealing oven. Fig. 4 is a diagrammatic view of the cold-rolls and means of carrying the plates thereto.

To construct a furnace in accordance with my invention, I build from a suitable refractory material a long narrow furnace separated or divided by a cross-wall into two chambers A and B, the chamber A being provided with a gas-burner 1 and flue 2, by means of which the said chamber may be heated to the required temperature necessary to anneal the sheets. The chamber B is for the purpose of gradually reducing the temperature of the sheets as they pass from the hot chamber A, and when the said sheets are expelled from the rear of the furnace they will be comparatively cold. To carry these sheets from the front of the furnace to the rear, I arrange a series of rollers 3, mounted in pairs, with their shafts 4 journaled in the side walls of the furnace. These rollers 3 are placed in line the one pair with the other, and of a distance apart less than the length of the sheets operated upon, and the said rollers 3 are of a length almost equal to the space between the walls of the furnace. Inclosing these rollers 3 is a muffle 6, formed of cast metal or other suitable material, which is a form that will properly guide the sheets from one pair of rollers 3 to the next ahead and is used to protect the sheets from the air for a purpose well known in the art. Each pair of rollers 3 are geared one with the other by means of small gear-shafts 8, attached to their respective shafts 4. To rotate the entire train of rollers 4 in unison, a small bevel-gear 9 is attached to the shaft 4 of each of the lower rollers 3, the said gears meshing with a series of similar gears 9, attached to a counter-shaft 10, to which a drive-pulley 11 is connected. At the front and rear ends of the muffle 6 are hinged swinging flaps 7, adapted to close the entrance and exit, and thereby prevent the escape of heated air and to exclude cold air from entrance therein and at the same time not interfere with the entrance of the sheets into the muffle 6 or the exit from the same when traveling in the proper direction.

Arranged at the exit of the muffle 6 is a set of series of cold-rolls 5, which may be of equal or varying diameter, as shown in Fig. 4, the same being either in close proximity to the exit or at some distance away. When these cold-rolls 5 are located at a distance from the furnace, the sheets may be carried thereto and entered in the rolls in any suitable or desired manner.

In operation the sheets to be annealed are entered into the muffle 6, and by means of the rotary movement of the rollers 3 carried forward slowly through the hot chamber A, gathering a sufficient temperature before reaching the end of the same. In their continuous passage the sheets are carried through the cooling chamber B, reducing the temperature until almost cold before leaving the exit of the muffle, and from this point the sheets are carried to and through the cold-rolls 5, thereby making a continuous operation of the annealing and cold-rolling.

In bluing metal sheets the hot chamber A
and its muffle 6 are all that is necessary. Therefore the cold chamber B may be dispensed with.

It is obvious that various slight modifications of my improved annealing-furnace may be made without departing from the spirit of my invention. Therefore I do not confine myself to the exact construction shown and described.

9 Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination with a furnace composed of refractory material divided by a central wall into a hot chamber and a cooling chamber, said wall having a horizontal opening, and means for heating the hot chamber, of a series of pairs of rolls arranged in said furnace and in front of the hot chamber, said pairs of rolls being arranged in line with each other, a muffle extending through said horizontal opening in the wall and inclosing said rolls throughout the series, and means arranged at the front and rear of said muffle for excluding the cold air therefrom, substantially as described.

2. The combination with a furnace composed of refractory material and divided by a central wall having an opening into a hot chamber and a cooling-chamber, and means for heating the hot chamber, of a series of pairs of rolls arranged within said furnace and in front of the hot chamber, said pairs of rolls being arranged in line with each other, means for driving said rolls, a muffle extending through the opening in the central wall and inclosing said rolls throughout the series, and means arranged at the front and rear of said muffle for excluding the cold air therefrom, substantially as shown and described.

3. The combination with a furnace composed of refractory material and divided by a central wall having an opening into a hot chamber and a cooling-chamber, means for heating the hot chamber, a series of pairs of rolls arranged in sequence throughout the said chambers and at the front and rear of the furnace, a muffle extending through the opening in the central wall and inclosing said rolls, and means arranged at the front and rear of said muffle for excluding the cold air therefrom, substantially as described.

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

JOHN JENKINS.

Witnesses:

M. E. HARRISON,
JAS. V. McMASTERS.