

G. F. SIMONDS.

Tempering Ovens for Steel and Iron.

No. 151,167.

Patented May 19, 1874.

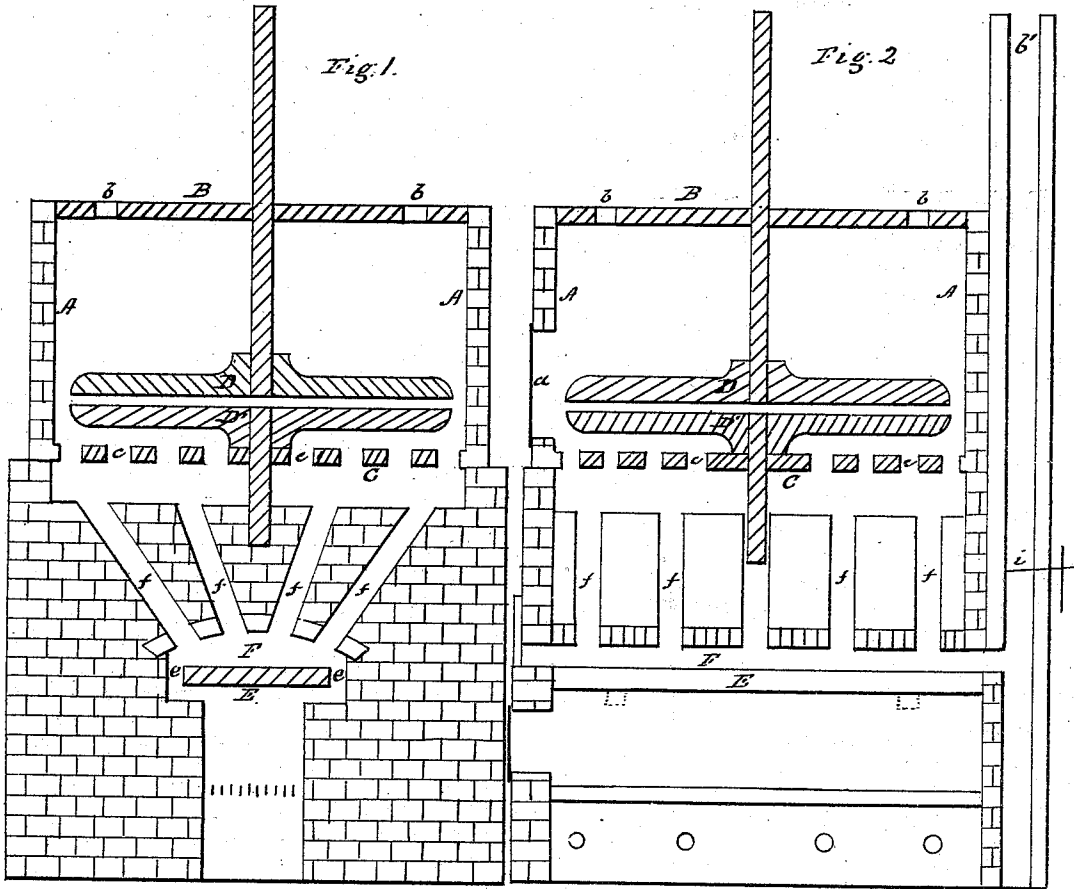
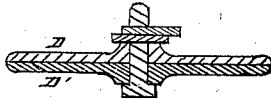


Fig. 3.

WITNESSES=

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INVENTOR

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GEORGE F. SIMONDS, OF FITCHBURG, MASSACHUSETTS, ASSIGNOR TO
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IMPROVEMENT IN TEMPERING-OVENS FOR STEEL AND IRON.

Specification forming part of Letters Patent No. 151,167, dated May 19, 1874; application filed
April 7, 1874.

To all whom it may concern:

Be it known that I, GEORGE F. SIMONDS, of Fitchburg, in the county of Worcester and State of Massachusetts, have invented an Improved Tempering-Oven; and I do hereby declare that the following, taken in connection with the drawings which accompany and form part of this specification, is a description of my invention sufficient to enable those skilled in the art to practice it.

My invention relates to that class of ovens used for tempering, or for tempering and forming, articles of steel, or of steel combined with iron, according to the improved process patented to Simonds and Ferson May 5, 1874, and numbered 150,625; and it consists in so constructing the oven as to secure an evenness of heat during the process.

To enable others skilled in the art to make and use my invention, I will proceed to describe the exact manner in which I have carried it out.

Referring to the drawings, Figure 1 represents a vertical cross-section of my oven as resting over a furnace. Fig. 2 is a vertical longitudinal section of the same. Fig. 3 shows the clamps for holding the article to be tempered and formed.

In tempering-ovens heretofore made the clamps or dies have been placed in direct contact with the fire, where it is found impossible to produce the evenness of heat essential to success.

The great purpose of my invention is to avoid any direct contact of my clamps with the fire, and only allow them to receive the heat after it has been evenly dispersed, thereby securing a uniformity of heat throughout the clamps and the article to be treated.

In the drawings, A A represent the walls of an oven-chamber, B the roof or top, and C the bottom. In the front wall is a suitable door, *a*, for the introduction of the articles to be tempered and formed. In the top of the chamber I construct openings *b*, usually about four in number, to allow the heat to pass off, and produce a draft when the smoke-flue *b'* is closed, as hereinafter described. In the bottom C are the openings *c*, to allow the heat

to distribute itself evenly through the oven and surround the clamps D D', which compress the article to be tempered and formed. Immediately over the fire-box I place a heavy fire-proof tile, E, extending slightly over the sides of the fire-place, so as to catch and arrest the direct heat from the flame. Air-passages *e* are left, however, on each side of the tile. Above the tile, and between that and the arch of the fire-box, is formed the hot-air chamber F, into which the air-passages *e* lead. Above the hot-air chamber, and leading through the masonry to the tempering and forming oven, are the radiating-flues *f*, which again distribute and equalize the heat before it reaches the perforated bottom of the oven. This bottom, in turn, becomes heated throughout its extent, and materially aids in producing that evenness of temperature within the oven which is absolutely required to secure success.

Under certain circumstances it becomes desirable to close the perforations in the bottom of the chamber in order to shut off the gas—for instance, when the operator who is in charge wishes to determine the condition of the article being treated by its color. In that case, heat alone should be admitted to the oven.

When the article to be tempered and brought to its ultimate form has been properly hardened, it is placed between the clamps D D', and there secured by any convenient device. I prefer the use of wedges driven into the slotted rod, as shown in Fig. 3, as screws become troublesome after being heated to a red heat. The clamps may rest within the oven, and be operated by the rod *d'*, or they may be constructed as shown in Fig. 3. In the latter case, the article to be treated is properly compressed between the clamps, and the clamps secured, after which they are passed into oven for tempering and forming, the form of the clamp, as shown, allowing a free contact with the heat throughout its entire surface, excepting only the central pivot, on which it rests on the bottom of the oven. By closing the damper *i*, the entire heat is sent into the oven.

Having thus described my invention, what I

claim as new, and desire to secure by Letters Patent, is—

1. In a tempering and forming oven, an intervening plate between the fire and the clamps, for the purpose of securing an evenness of heat in the clamps, substantially as and for the purpose set forth.

2. A tempering and forming oven constructed with a perforated bottom, for the admission and even distribution of the heat around the

articles to be treated, substantially as and for the purpose set forth.

3. A tempering and forming oven constructed as described, in combination with the passages *c*, hot-air chamber F, and tile E, when arranged to operate as set forth.

GEORGE F. SIMONDS.

Witnesses:

ALFRED HITCHCOCK,
ALVAN A. SIMONDS.