H. Disston,

Tempering Furnace.

No. 107,599. Patented Sept. 20. 1870.

FIG. 1.

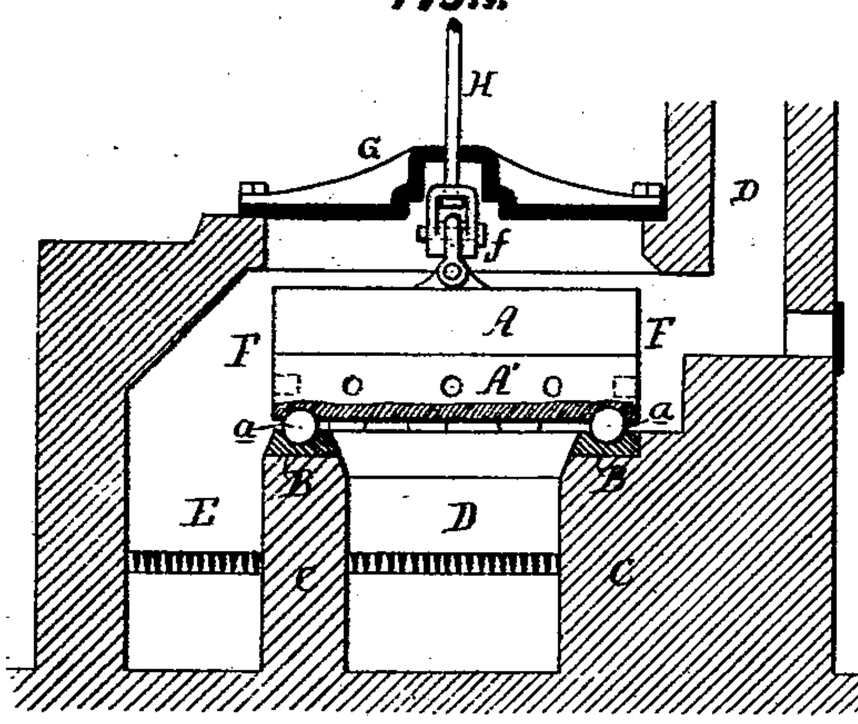


FIG. 2.

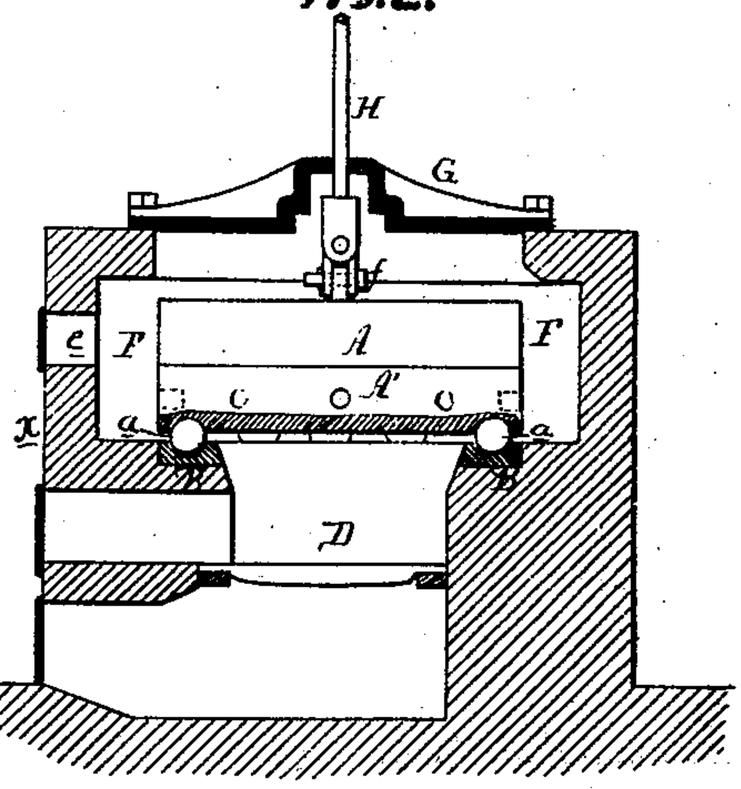


FIG. 3.

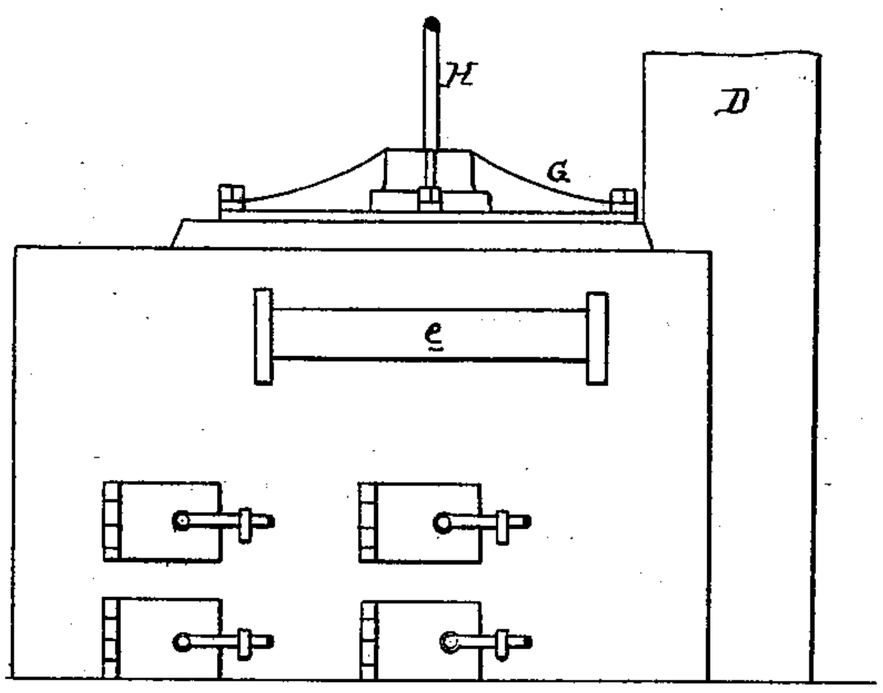


FIG. 4.

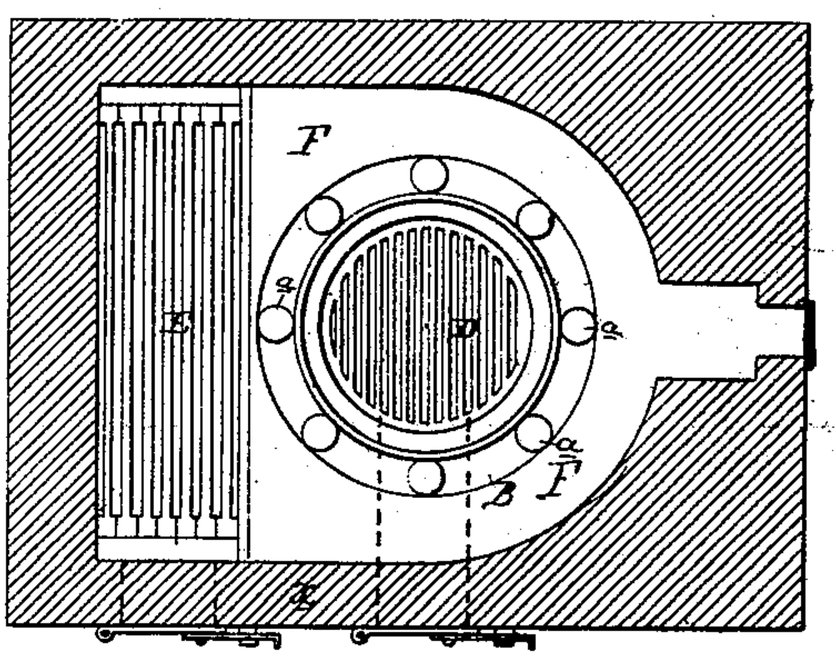
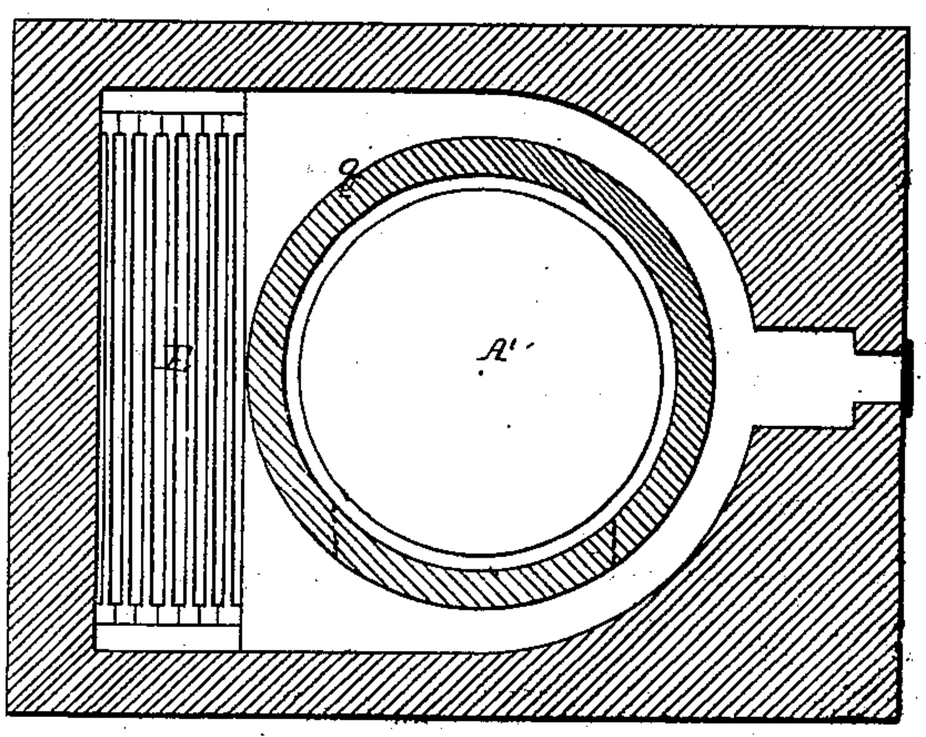


FIG. 5.



WITNESSES { Wm. A. Steel. Jno. B. Harding.

Henry Disston By his Attys Howson & Sons

United States Patent Office.

HENRY DISSTON, OF PHILADELPHIA, PENNSYLVANIA.

Letters Patent No. 107,599, *dated September* 20, 1870.

IMPROVEMENT IN COMBINED FURNACE OR OVEN AND TEMPERING-DIES.

The Schedule referred to in these Letters Patent and making part of the same.

I, HENRY DISSTON, of Philadelphia, county of Philadelphia, State of Pennsylvania, have invented a Combined Furnace or Oven and Tempering-Dies, of which the following is a specification.

Nature and Object of the Invention.

My invention relates to a furnace and dies for conducting the process of simultaneously straightening and tempering thin articles of steel, for which Letters Patent of the United States, No. 9,237, were granted to John Silvester, August 31, 1852, and of England July 17, 1850; and

My invention consists in constructing and arranging the dies, as fully described hereafter, so as to maintain the same at a constant uniform temperature.

The main object of my invention, which is fully described hereafter, has been to conduct the aforesaid process of John Silvester with facility, regularity, and efficiency, and without removing the dies from the furnace.

Description of the Accompanying Drawing.

Figure 1 is a vertical section of my combined furnace and tempering-dies;

Figure 2, a transverse vertical section;

Figure 3, a front view;

Figure 4, a sectional plan; and

Figure 5, a plan view, showing a modification of my invention.

General Description.

A and A′ are two heavy cast-iron dies, the under face of the upper die and the upper face of the lower die being made perfectly true.

The lower die has on its under side an annular concave channel, adapted to spheres *a*, which are arranged to traverse in a similar channel in a plate, B, resting on walls C C, which form part of the furnace, and which surround the fire-place D, the latter being situated immediately beneath the lower die.

Another fireplace E communicates with the chamber F, containing the dies, and is somewhat larger than the latter, as shown in figs. 1 and 4, there being suitable openings in the front wall *x* of the furnace, through which the fuel is introduced to the fire-places, and also openings communicating with the ash-pits of the same, all these opening being provided with suitable doors, as shown in fig. 3.

The chamber F, containing the dies, communicates with the chimney D, the latter being provided with suitable dampers, by which the draught may be regulated.

An elongated opening, *e*, provided with a suitable door, is formed in the front wall of the furnace, for the introduction of the blades of circular and other saws, and other objects of thin steel, and a corresponding door-way may be formed in the rear wall of the furnace.

In the periphery of the lower die is a number of holes, into any one of which can be inserted a bar or lever, so that, by the aid of the latter, the dies can be turned from time to time, and the entire periphery of the dies thereby exposed to the direct heat from the fire-place E; for it is of importance that the dies should be uniformly heated throughout.

The upper die A is connected by a swivel-joint, *f*, to a rod, H, which passes through the cover G of the chamber F, and which is connected to any suitable appliances for raising and lowering the upper die.

Fire having been kindled in the fire-places D and E, and dies having been thereby made sufficiently hot throughout, care is taken to maintain them at the desired heat by a proper manipulation of the dampers of the chimney, and of the fire-place and ash-pit doors.

In hardening flat pieces of steel—the blades of circular saws, for instance—they are always more or less warped, and to straighten them, and at the same time to reduce the temper of such blades, is the object of my invention.

The upper die A is elevated, and a hardened and warped blade is passed through the opening *e* onto the lower die, after which the upper die is at once lowered.

By the combined heat and pressure to which the blade is thus subjected, it is straightened and tempered simultaneously, as described in the aforesaid patent of John Silvester.

After the blade has been reduced to the desired temperature, the upper die is raised and the blade withdrawn, prior to the introduction of another blade.

In the modification shown in fig. 5, the dies are surrounded by a shield, *q*, of brick-work or other material, which is contiguous to, but free from contact with the dies.

This shield, in which are suitable openings, for admitting the articles of steel, may extend over the top of the dies, so as to prevent the direct action of the heat on the same, which has a tendency to warp the dies.

I do not claim, broadly, the arrangement of dies within a furnace; but

I claim—

1. The combination of a chamber, F, containing

a lower die, A′, and upper die A, adjustable vertically, a fire-place, D, arranged below the lower die, and a fire-place, E, communicating with the chamber F, all substantially as described.

2. The die A′, supported on spheres or rollers above a fire-place, substantially as specified.

3. The upper die, suspended by a swivel-joint to a rod which passes through the top of the furnace, and which is connected to any suitable mechanism for raising and lowering the said upper die.

4. The shield *q*, arranged within the furnace and around the dies, as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HENRY DISSTON.

Witnesses:
H. HOWSON,
A. H. SHOEMAKER.