

E. H. Grant.

Tempering Metals.

N^o 90,093. Patented May 18, 1869.

Fig. 1.

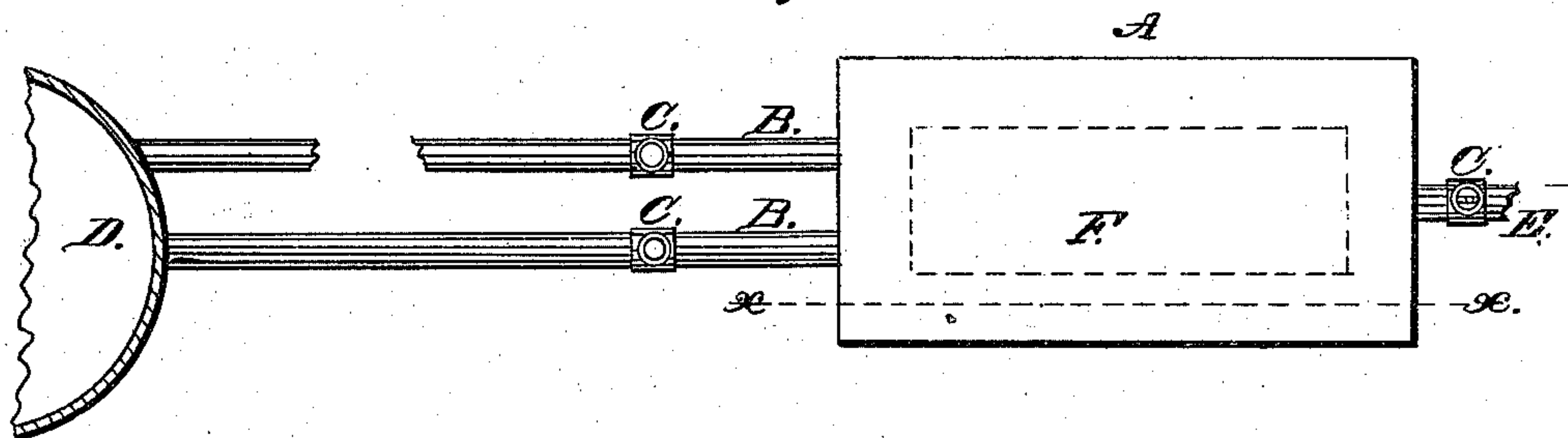
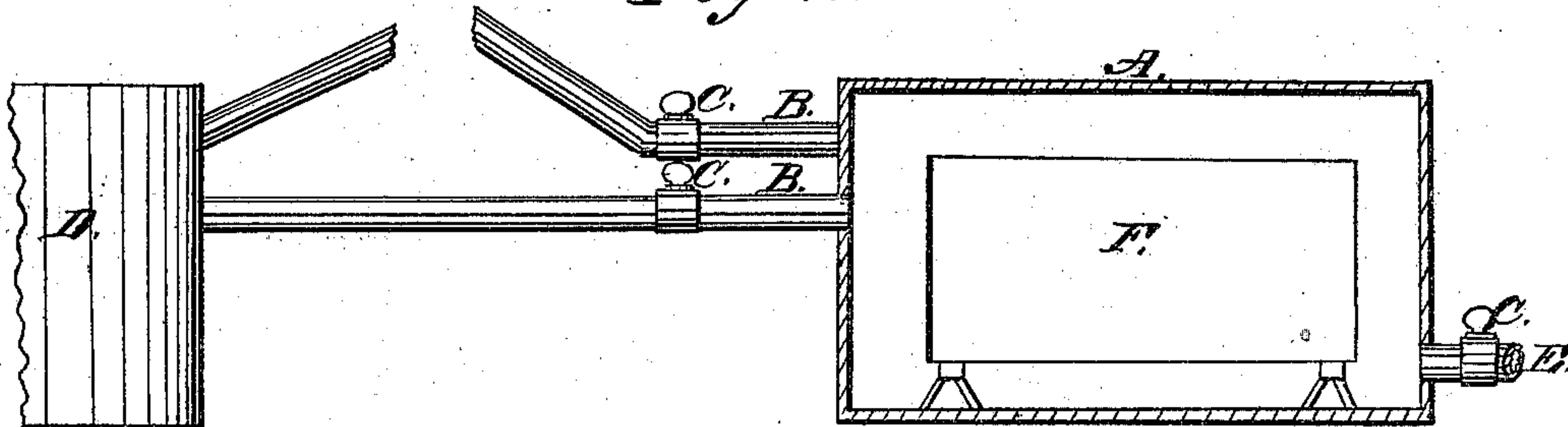


Fig. 2.



Witnesses.

Thomas T. Parker,
F. Smith

Inventor.

Edwin H. Grant.

United States Patent Office.

EDWIN H. GRANT, OF WASHINGTON, DISTRICT OF COLUMBIA.

Letters Patent No. 90,093, dated May 18, 1869.

IMPROVED PROCESS OF TEMPERING METALS.

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

To all whom it may concern :

Be it known that I, EDWIN H. GRANT, of Washington, in the District of Columbia, have discovered and invented a new and useful Process for Tempering Metals, which consists in the use of a current of steam, as will be hereinafter described; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing, and to the letters of reference marked thereon, and being a part of this specification, said drawing showing one method of applying my process.

Figure 1 is a plan view of my apparatus, used in said method of applying my process.

Figure 2 is a vertical section of the same portions of my apparatus which are shown in fig. 1. This view represents a section cut through the lines *x x*, shown on fig. 1.

The same letters indicate like parts in each figure.

The object of my invention is the tempering of metals, or the hardening of their surfaces by cooling them rapidly, by means of an apparatus so constructed as to conduct steam by suitable pipes from a steam-generator, or from pipes connecting with it to a steam-chest, or enclosure, so constructed as to receive the heated metal, or such parts of it as are to be tempered, and to allow the passage of a jet or current of steam to pass freely in actual contact with and over the surface of the metal to be tempered, and then to escape from such enclosure.

To enable others skilled in the art to use my process, and to make the necessary apparatus, I will proceed to describe the construction and operation of the apparatus used in the method of applying my process, referred to in the accompanying drawing.

I construct a steam-chest, or enclosure A, in any of the known forms, and of any of the known materials suitable for such purpose, and apply thereto one or more induction-pipes B B, which connect with the steam-generator D, or with pipes leading from it.

These induction-pipes are furnished with any valves or stop-cocks C C, now in use, and not covered by Letters Patent.

I also apply to the enclosure A an eduction-pipe, or opening E.

Within the enclosure A, I place the surface of the heated metal F which is to be tempered.

The apparatus being then ready for use, I let into the enclosure A, a jet, or current of steam, through the induction-pipes B B, by means of the valves, or stock-cocks C C, from the generator D, or from its connecting-pipes, and cause this jet, or current of steam to pass in close and actual contact with the surface of the heated metal F, and escape from the enclosure A through the eduction-pipe, or opening E.

It is apparent that a current of steam, in passing from a generator through a steam-chest, or enclosure, and over the surface of a mass of heated metal enclosed therein, will take up and carry away the heat from the surface of such metal with rapidity.

It is also apparent that the rapidity of this convection of heat will be governed by the bulk, temperature, and nature of the metal, and by the bulk, temperature, force of current, and nearness of contact of the steam passing over its surface and through such enclosure.

It is also apparent that the escaping current of steam may be used for any purpose to which steam of its temperature is applicable, after having been so used.

What I claim, and desire to secure by Letters Patent, is—

1. The process of tempering metals by the use of a jet, or current of steam, as described.
2. The combination of the steam-chest, or enclosure A, the induction-pipes B B, the valves, or stock-cocks C C, the steam-generator D, and the eduction-pipe, or opening E, for the uses and purposes substantially as described.

EDWIN H. GRANT.

Witnesses:

CHAS. C. ADAMS,
ALBERT CLARK.