

JOSEPH CROOKES.

Furnaces for Heating Saws for Hardening and Tempering.

119,078.

Patented Sep. 19, 1871.

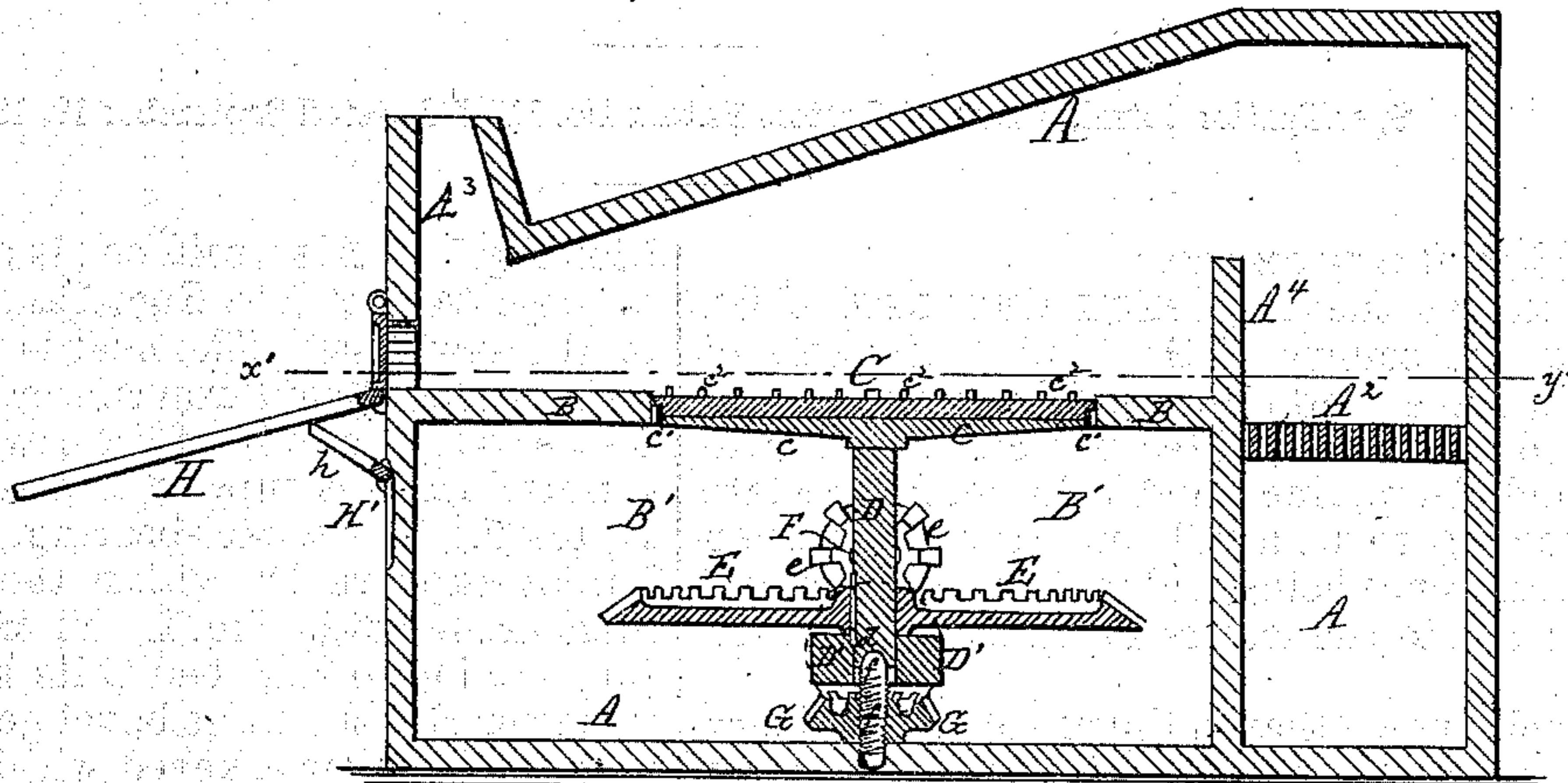


Fig. 1.

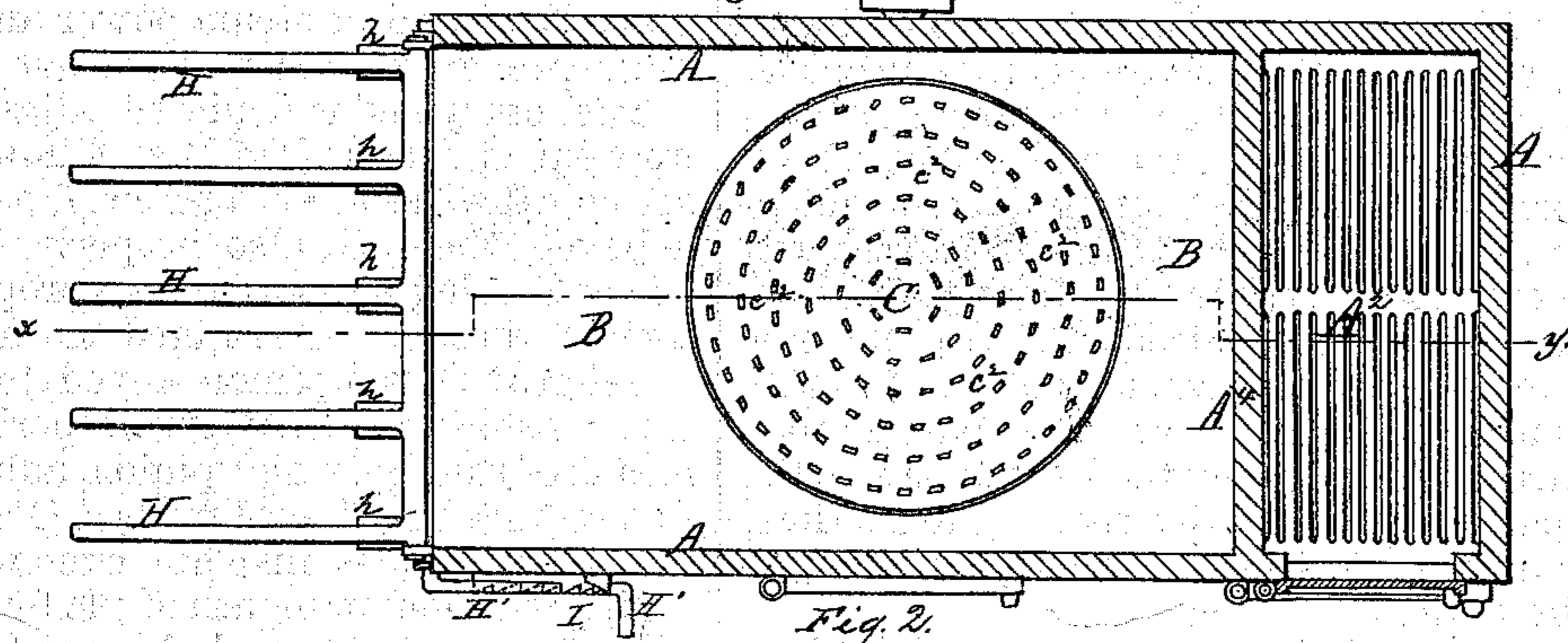


Fig. 2.

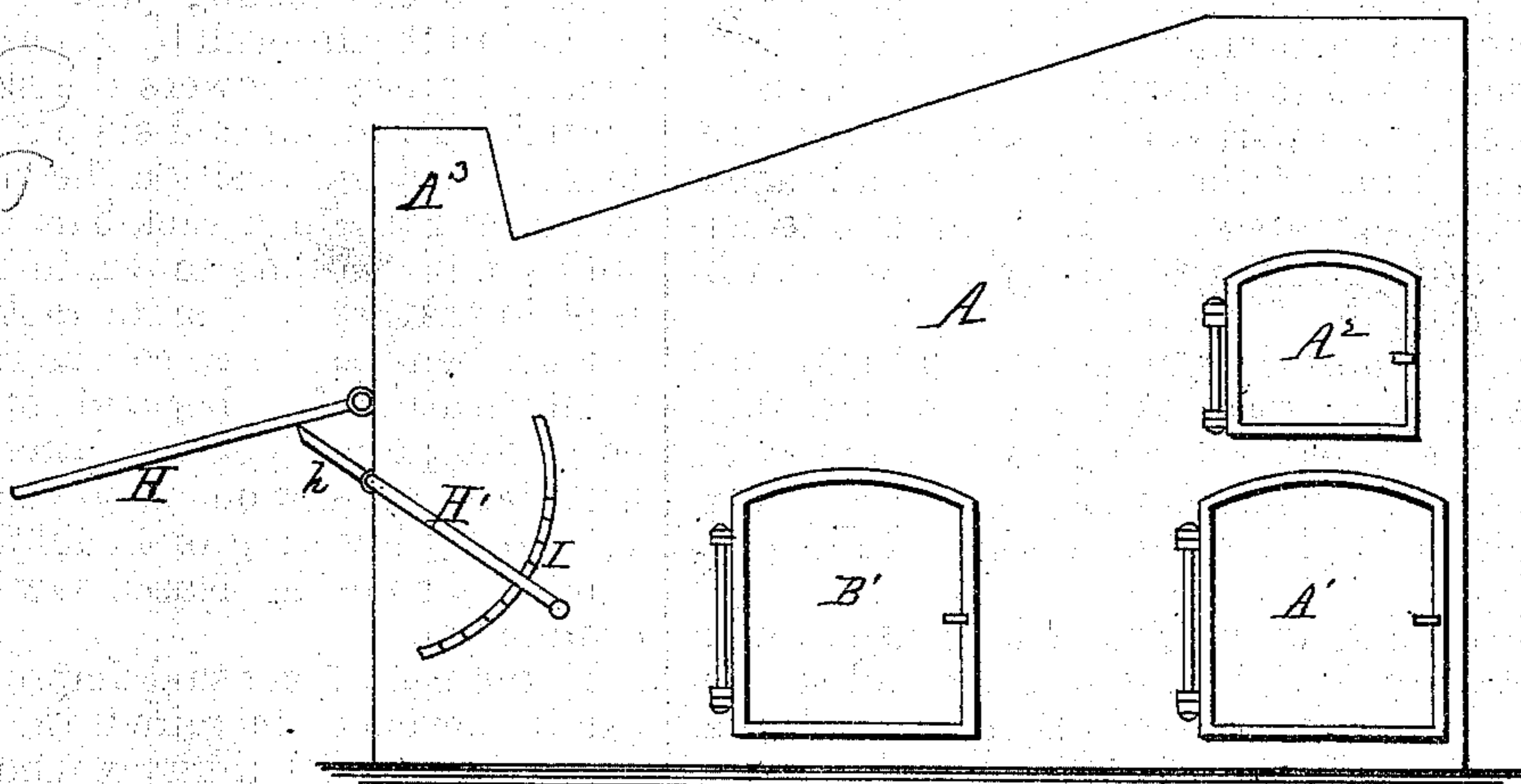


Fig. 3.

Witnesses:

Robert Burns.
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Inventor:

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per Herthel & Co.
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UNITED STATES PATENT OFFICE.

JOSEPH CROOKES, OF ST. LOUIS, MISSOURI.

IMPROVEMENT IN FURNACES FOR HEATING SAWS FOR HARDENING AND TEMPERING.

Specification forming part of Letters Patent No. 119,078, dated September 19, 1871.

To all whom it may concern:

Be it known that I, JOSEPH CROOKES, of St. Louis, in the county of St. Louis and State of Missouri, have made a certain new and useful Improved Furnace for Heating Saws for Hardening and Tempering; and I do hereby declare the following to be a full and true description thereof, reference being had to the accompanying drawing and to the letters of reference marked thereon.

It is well known that in the use of the ordinary furnace the steel plates, circular saws, &c., to be heated, hardened, and tempered, lie flat upon the fire-bed, and that, to prevent unequal heating of the saw, the same must be frequently turned or rotated. The usual method of rotating or moving the saw by means of a rod with a small hook turned on its end does in a very inadequate manner prevent the unequal heating of the saw; and furthermore, the teeth are frequently crooked, turned, or otherwise impaired, and, also, the saw is made to jam against the sides of the furnace. Furthermore, it is well known that bars or rods of iron are used to convey the heated saw to the cooling-pan or tank. All this requires extra time, labor, and expense, which to avoid is the object of this invention.

The nature of this invention relates, therefore, to forming an adjustable rotary fire-bed with top ribs or projections to support the saw in the heating-chamber and to allow for an equal distribution of heat to all parts of the saw; also, in providing the front of the furnace with a hinged-bar platform, operated by a rack-bar, and to certain detail construction of parts, all of which will now be more fully described.

To enable those herein skilled to make and use my said improvements, I will now more fully describe the same, referring to accompanying Figure 1 as a sectional elevation at line xy ; Fig. 2, as a sectional plan at line $x'y'$; and Fig. 3, as a side elevation.

The furnace A is constructed, as usual, with ash-pit A¹, grate A², bridge-wall A⁴, and smoke-stack A³. Under the fire-bed B, however, I form an air-chamber, B', in which the gearing mechanism hereinafter described is contained. In the fire-bed B is arranged a circular fire-bed, C. Said bed C I construct of fire-brick material, resting on a cast-iron plate, c , with wrought-iron rim c^1 .

(See Fig. 1.) Also, said bed is provided with ribs or projections c^2 , (see Figs. 1 and 2,) on top whereof the saw rests. The heat is thus permitted to strike between said iron ribs or projections c^2 , under as well as on top of the saw. The rotary bed C thus formed is supported upon a vertical shaft, D, resting in a socket-bearing, d , in a horizontal bar or support, D', within the air-chamber, in manner shown in Fig. 1. In order to impart rotary motion to said bed C its shaft D carries at its lower end the large bevel-gear E, arranged to mesh with pinion e , keyed within air-chamber on end of driving-shaft F. The shaft F may be operated by hand or steam-power and, with disengaging-lever, be thrown in or out of gear.

The rotary-bed is rendered adjustable to follow up wear of the fire-bed B as follows: Forming a step for the shaft D is a screw, f , passing through a bevel-wheel, G, also properly threaded, said wheel G being supported on a proper step at bottom of furnace. Arranged to mesh with said bevel-gear G is a pinion keyed to the end of a driving-shaft, which, when properly operated by means of said gear and pinion, adjusts the screw f as required. The rotary-bed C can thus be retained at all times flush and even with fire-bed B.

Near the door or mouth of the furnace is hinged a bar-frame or slide-rack, H, (see Fig. 2,) made to extend to the cooling-pan. A crank-shaft, H', hinged to the fire-wall by means of its arms h , (see figures,) raises or lowers the slide-rack H, as required. To retain said slide-rack in its required level or inclined position the crank-rod H' is fitted to engage in a rack-bar, I, secured to side walls of furnace, as shown in Figs. 2 and 3. It is plain that, by raising the rack H to a level with the fire-bed B, the saw can be readily entered into the heating-chamber and rotated and subjected to the proper heating, after which the operator slides the saw out upon the rack or platform H, and, by lowering or inclining said platform, can easily slide the heated saw edgewise into the cooling-pan.

In the use of my said improvements the saw can in nowise be impaired, the teeth remaining perfectly true, all liability to jamming being avoided, thus, in effect, lessening the consequent labor of straightening and trueing the saws; also, the regular rotary motion imparted to the saw will cause the same to be equally heated throughout,

and thus prevent any springing of the saw in hardening and tempering.

Having thus fully described my said invention, what I claim is—

1. The adjustable rotary-bed C, constructed as described, its shaft D, bevel-gear E, pinion *e* arranged in air-chamber B', in combination with furnace A, substantially as and for the purpose described.

2. The slide-rack H, crank-rod H', arms *h*, and rack-bar I, in combination with furnace A, substantially as and for the purpose set forth.

In testimony of said invention I hereunto set my hand.

JOSEPH CROOKES.

Witnesses:

WILLIAM W. HERTHEL,
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(66.)