

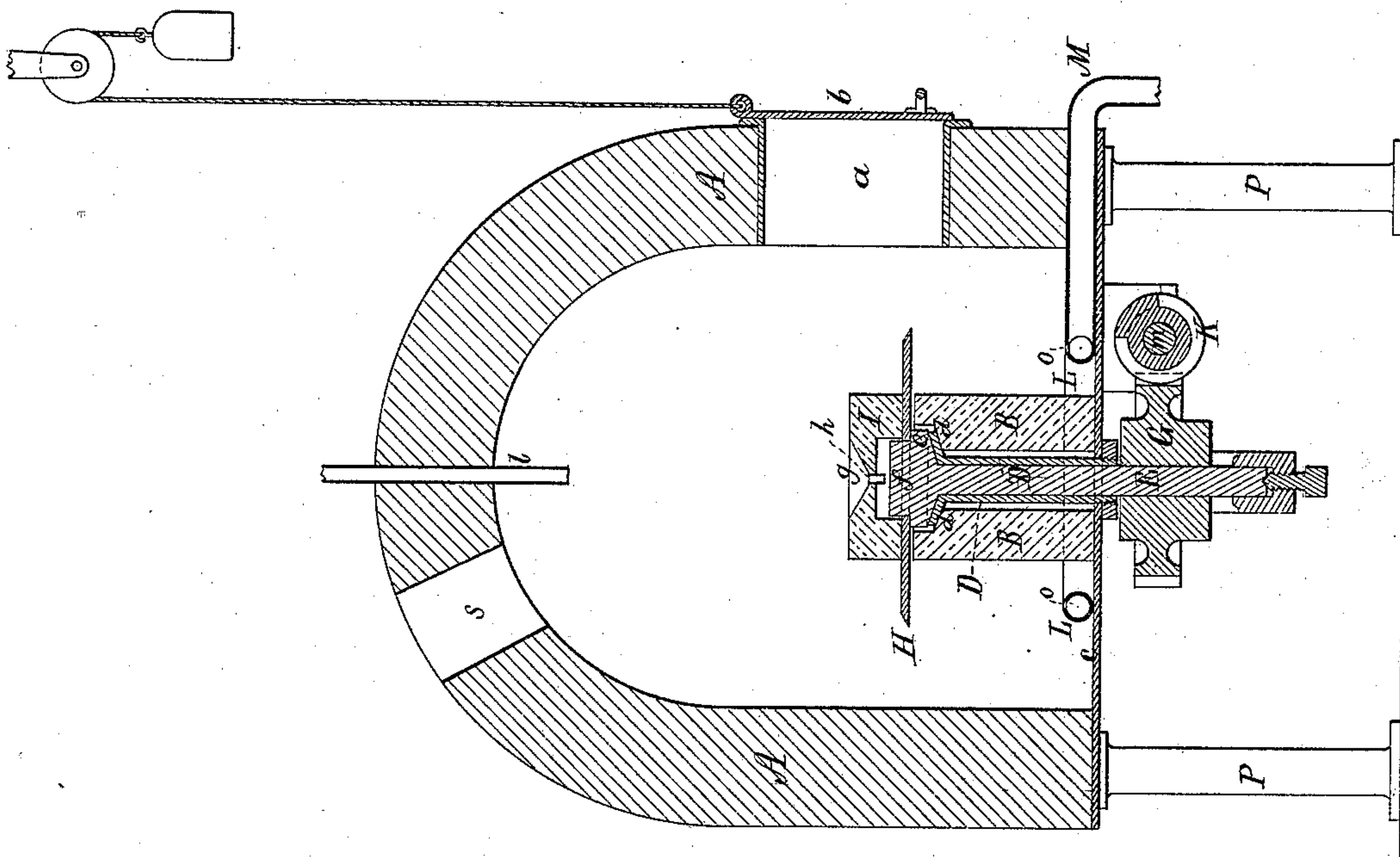
(No Model.)

A. McDONALD.

FURNACE FOR HEATING DISKS.

No. 310,902.

Patented Jan. 20, 1885.



Witnesses.

S. N. Piper
E. D. Pratt

Inventor .

Alexander Mc Donald.

by R. H. Eady att'y.

UNITED STATES PATENT OFFICE.

ALEXANDER McDONALD, OF CAMBRIDGE, MASSACHUSETTS, ASSIGNOR TO
THE McDONALD STONE CUTTING MACHINE COMPANY, OF NASHUA, N. H.

FURNACE FOR HEATING DISKS.

SPECIFICATION forming part of Letters Patent No. 310,902, dated January 20, 1885.

Application filed May 26, 1884. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER McDONALD, of Cambridge, in the county of Middlesex, of the Commonwealth of Massachusetts, have invented a new and useful Improvement in Furnaces for Heating the Disk-Shaped Cutters of Machines for Cutting or Dressing Stone; and I do hereby declare the same to be described in the following specification, and represented in the accompanying drawing, which is a vertical section of a furnace embodying my invention, the nature of which is defined in the claims hereinafter presented.

The said furnace is to heat a steel disk-shaped cutter in the process of tempering it. Although such furnace is specially intended for heating such cutters, it, or one substantially like it, may be employed to advantage in heating a circular saw or a simple disk of metal preparatory to tempering or otherwise treating it. By this furnace the disk-shaped cutter is heated uniformly at its periphery, and in each circular part of it concentric therewith, and is thereby uniformly expanded in such circular portion and periphery. So heating the cutter operates to prevent it from warping or cracking in the process of tempering it, or while it is in the act of being heated or cooled.

In the drawing, A denotes the furnace shell or body, provided with a suitable discharge-educt, *s*, a mouth, *a*, and a counterbalanced or other proper door, *b*, thereto, and supported on a series of brick or other suitable posts, P. The bottom or hearth *c* of such furnace is an iron plate having extended upward from it a tubular standard, B, of fire-clay or some fire-resisting material. There is within the standard B an iron tubular column, D, provided at top with a tapering or funnel-shaped mouth, *d*. At its foot this column rests on and is secured to the hearth. A vertical spindle or shaft, E, suitably pivoted at its foot, and provided with a worm-gear, G, extends upward in and through and takes a bearing in the hollow column D, such shaft at its upper part being provided with an annular shoulder, *e*, and a projection, *f*, extended upward therefrom, as represented. This shoulder is arranged a short distance above the top of the column B, and is to support a disk-

shaped cutter, H, when placed on it as represented, with the projection *f* going through the eye of the said cutter and entering a fire-resisting clay cap, I, placed on the cutter concentrically thereof, as shown. In the top of the said cap is a concavity or mouth, *g*, having at its central part the throat *h*, to open directly over the shaft E, there being immediately over such mouth *g* and in the crown of the furnace a pipe, *l*, to lead a stream of water into such mouth *g* when such may be desirable. A worm or screw, K, fixed on a shaft, *m*, engages with the gear G, and when put in revolution will slowly revolve the shaft or spindle E, and thereby cause the disk-shaped cutter and the cap resting on it to be correspondingly revolved.

Surrounding the column B and on the hearth is a hollow ring or circular blast-pipe, L, foraminous, or having numerous holes, *o*, in its upper part. A pipe, M, opening out of the ring and going through the furnace, serves to convey air from a bellows or air-blast apparatus into the ring, from whence such air will be driven through the holes *o* into the fuel on the hearth. A charge of fuel—as charcoal, for instance—being placed on the hearth and around the column B and subsequently fired, will while in combustion heat the disk-shaped cutter, which at the same time is to be kept in slow revolution. Water dropping upon the top of the spindle may be employed to keep the latter sufficiently cool, or at a temperature to prevent it from being injured by the heat of the furnace. By having the cutter revolved while being heated such cutter becomes evenly elevated in temperature at and near its periphery, and as a consequence becomes less liable to crack either in the heating or rapidly-cooling process for tempering it.

The hollow column or standard B, of fire clay or brick, serves to protect the shaft and its encompassing metallic column from injury by the fire. In some cases, however, the said column B, as well as the cap I and the column D, may be dispensed with; but it is preferable to have all of them, for without the hollow column D the shaft or spindle would be liable to be burned or injured by fire, and without the fire-brick or resisting sleeve or column B and cap I not only would the column D and shaft

or spindle be liable to be heated too much or injured by the fire, but the steel disk cannot be raised in temperature to so great advantage.

I claim—

5 1. The combination of the furnace shell or body provided with a hearth and mouth, a smoke-discharge opening or flue, and means of supplying such shell with air, with two concentric tubular columns extending upward
10 from such hearth, and with a shaft or spindle going upward through and within the inner of said tubular columns, and provided with mechanism for revolving it—the said shaft or spindle—and with means of supporting on it and

within the shell a metallic disk or cutter, as 15 and for the purpose set forth.

2. The combination of the furnace with a shaft arranged within it, and having mechanism for revolving it—the said shaft—with one or more fire-resisting tubular columns concentric with such shaft, the said shaft being provided at its upper part with means of supporting a metallic disk, or such and a fire-resisting cap resting on it, as set forth.

ALEXANDER McDONALD.

Witnesses:

R. H. EDDY,
E. B. PRATT.