

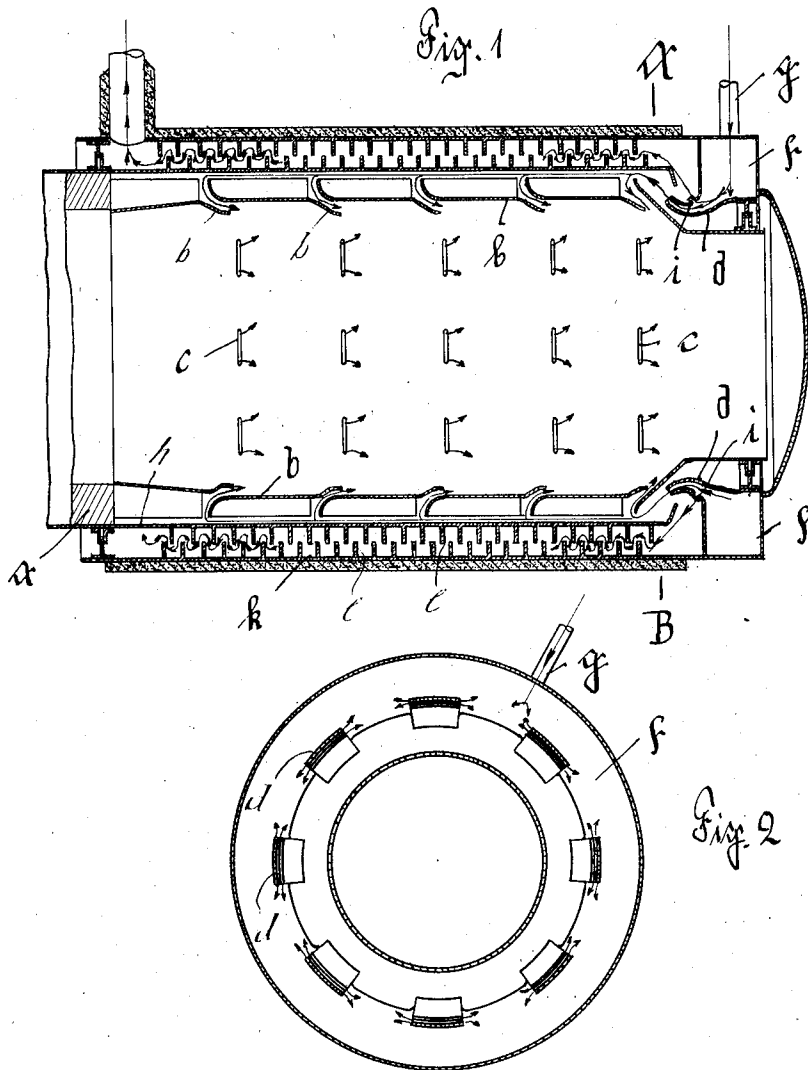
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DEVICE FOR UTILIZING THE HEAT RADIATED FROM KILNS

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DEVICE FOR UTILIZING THE HEAT RADIATED FROM KILNS.

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This invention relates to a device for utilizing the heat radiated from kilns, especially rotary kilns. The principal object of my invention consists in providing a kiln construction by means of which a part of the heat which is used for burning all kinds of material in the kiln may be recuperated in order to improve still further the operation of the kiln from an economical point of view. The invention consists essentially therein that the cooling and combustion air is introduced into a cooling jacket provided around the kiln, said cooling jacket having preferably the shape of a hollow cylinder, and that said air after having been heated in said jacket is conveyed to the interior of the kiln through slots disposed around the periphery of the cooling zone. Thus the cooling air will be preheated at the inner walls of the cooling jacket and at the same time serve for cooling the walls of the kiln and the material therein. The technical progress which may thus be obtained by this device may still further be considerably increased by providing around the aforementioned hollow cylinder which serves as a cooling jacket proper heat receiving or collecting members, for instance ribs, radiators or the like, along which air is likewise pressed or drawn in for the purpose of preheating. The heat thus recuperated may now be utilized for any desired purpose and even be returned wholly or partly to the kiln.

The cooling drum in order to form the aforementioned hollow cylinder may be constructed in different ways. For the purpose in view it is essential that upon the inner wall of the cooling drum, there are disposed nozzles through which the cooling air may be passed into the interior of the kiln. The inner surface of the hollow cylinder or cooling drum in accordance to this, for instance, may be equipped with a plurality of cooling shovels or plates which are provided with small slots in order to permit discharge of the preheated cooling and combustion air.

The invention is illustrated diagrammatically and by way of example on the accompanying drawing of which Fig. 1 is an axial section of a device designed according to this invention, and Fig. 2 a cross-section in the plane A—B of Fig. 1, as seen from the left to the right.

The cooling drum *h*, for instance may form a continuation of the rotary kiln *a*, in axial direction thereof, only the right-hand end of said kiln being shown in Fig. 1. In this manner the combustion as well as the preliminary and the final cooling may take place in a continuous or unitary tube, composed of the kiln *a* and the cooling drum *h*. The latter also may be driven separately from the kiln and arranged, for instance, below the latter. This arrangement would not form a departure from my invention. The cooling drum *h* is constructed in the form of a hollow cylinder and on the inner surface of said hollow cylinder there are arranged a plurality of shovel-shaped plates *b* which form slots *c*. The cooling air which is blown in at the end of the cooling drum *h* by means of special nozzles *d* enters into the interior of the kiln by way of said slots *c*. Thus an intense preheating of the cooling air and simultaneously therewith a cooling of the plates *b* and of the material to be burned in the kiln will be obtained. The nozzles *d* project from a hollow ring *f* which is supplied with air by means of a fan through a pipe *g*. In addition to the nozzle *d* which serve for blowing the cooling air into the hollow cylindrical cooler *h*, additional nozzles *i* may be provided, said additional nozzles blowing cooling air into a protective jacket *k* provided around said cooling drum *h*. Furthermore, heat absorbing members, for instance, in the form of radiating ribs *l* or the like may be arranged on the interior wall of said jacket *k* and on the exterior wall of said cooling drum *h*, as indicated in Fig. 1. The preheated air may be used for a variety of purposes, such as drying raw material, coal or the like, or it may be conducted wholly or partly back into the kiln.

I claim:

1. A device for utilizing the heat radiated from kilns, comprising in combination, a cylindrical heat absorbing cooling drum associated with a kiln, apertures in said cooling drum, and means for passing air through said cooling drum and said apertures therein into the interior of said kiln.

2. A device for utilizing the heat radiated from kilns, comprising in combination, a cylindrical heat absorbing cooling drum associated with a kiln, said cooling drum hav-

ing an interior and an exterior wall, apertures in said interior wall, and means for passing air through said cooling drum and said apertures into the interior of the kiln, and a cooling jacket enclosing said cooling drum.

3. A device for utilizing the heat radiated from kilns, comprising in combination, a cylindrical heat absorbing cooling drum having an interior and an exterior wall, apertures provided in said interior wall, means for passing air through the hollow space intermediate said walls and through apertures into the interior of the kiln, a cooling jacket enclosing said cooling drum, heat-absorbing members in the form of cooling ribs provided intermediate said drum and said jacket, and means for passing additional air into said jacket past said heat-absorbing members.

4. A device for utilizing the heat radiated from kilns, comprising in combination, a heat-absorbing drum having an interior and an exterior wall, shovels provided on said interior wall and forming apertures therein, means for passing air through the hollow space intermediate said walls and through said apertures past said shovels into the interior of the kiln, a jacket enclosing said drum, additional heat-absorbing members intermediate said drum and said jacket, and means for passing additional air into said jacket past said heat-absorbing members.

5. A device for utilizing the heat radiated from kilns, comprising in combination, a

heat-absorbing drum associated with a kiln, said drum having an interior and an exterior wall, said interior wall comprising a plurality of distributed shovel-shaped members forming between them slots which terminate into the interior of said drum, and means for passing air into the hollow space intermediate said walls and through said slots into the interior of the kiln.

6. A device for utilizing the heat radiated from kilns, comprising in combination, a heat-absorbing drum associated with a kiln, said drum having an interior and an exterior wall, apertures in said interior wall, nozzles arranged at the free end of said drum and being directed towards the hollow space intermediate said walls, and means for supplying air to said nozzles to pass said air through said hollow space and said apertures into the interior of the kiln.

7. A device for utilizing the heat radiated from kilns, comprising in combination, a heat-absorbing drum having an interior and an exterior wall, apertures in said interior wall, projections provided on said exterior wall, a jacket enclosing said latter wall, projections interiorly of said jacket, a set of nozzles arranged at the free end of said drum and being directed towards the hollow space intermediate said walls, a further set of nozzles directed toward said jacket, and means for supporting air to both sets of said nozzles.

In testimony whereof I affix my signature.
FRITZ LUTHER.