(No Model.) 2 Sheets—Sheet 1.

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SMOKE STACK AND ATTACHMENT.

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Fig. 6

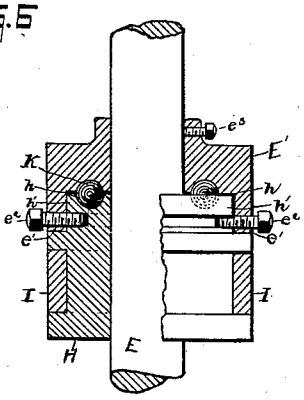


Fig. 7

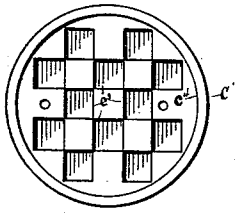


Fig. 8

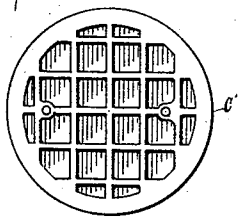


Fig. 1

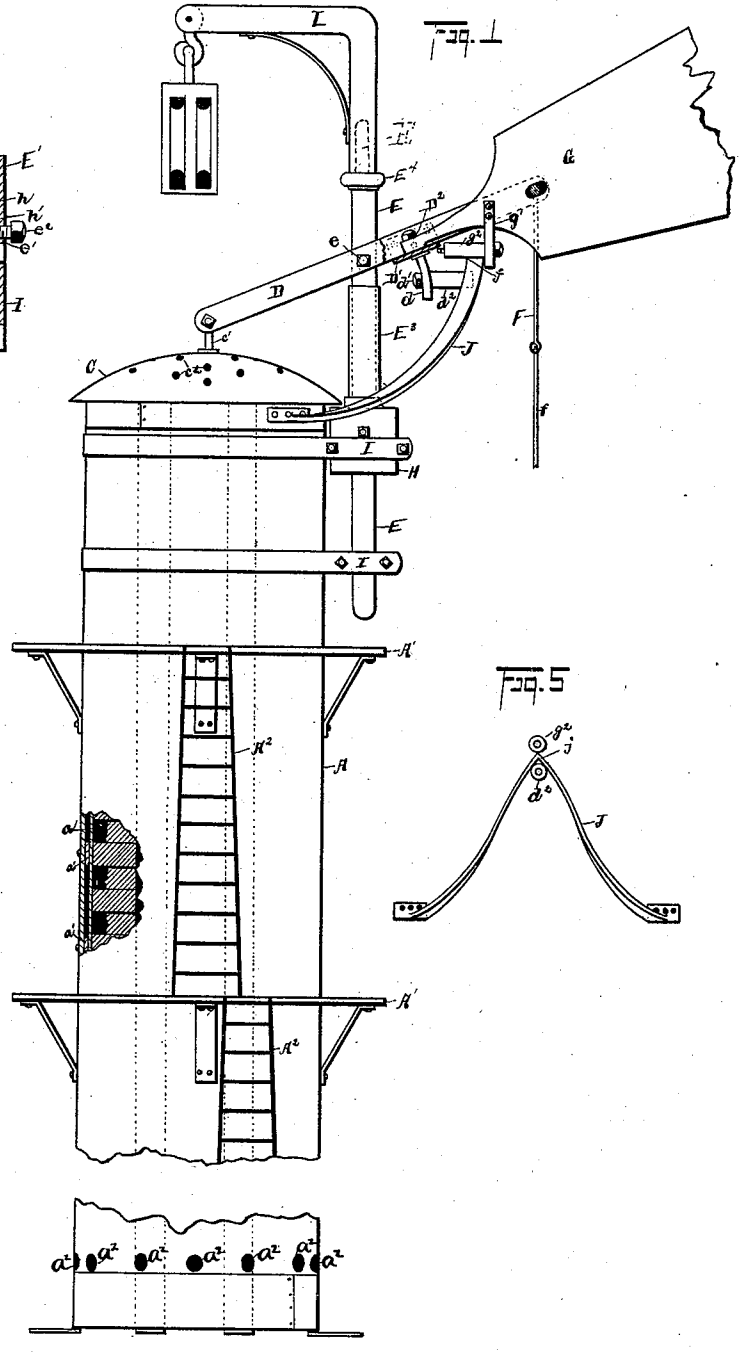


Fig. 5

WITNESSES.

Belle Lourie.

Geo. W. King

Baptiste Vitalis INVENTOR.

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N. PETERS. Photo-Lithographer. Washington, D. C.

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B. VITALIS.

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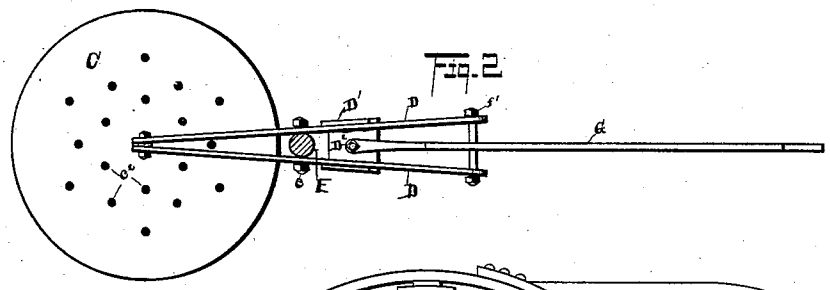


Fig. 2

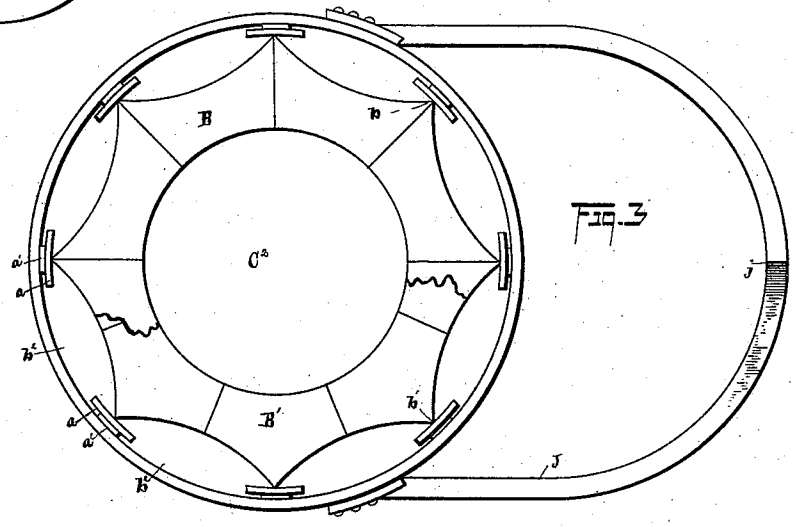


Fig. 3

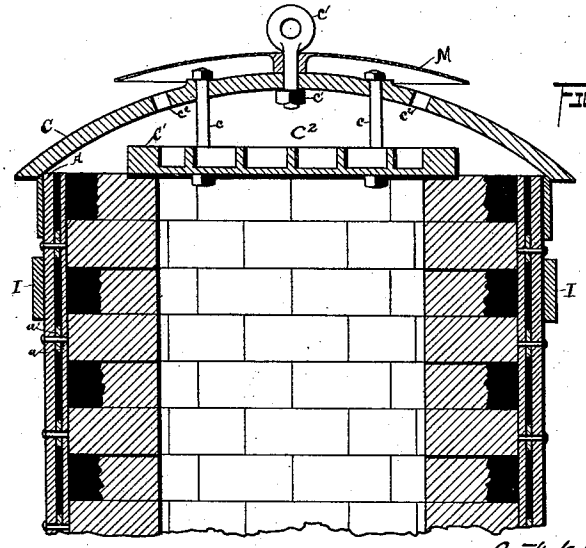


Fig. 4

WITNESSES.
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Geo. W. King.

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UNITED STATES PATENT OFFICE.

BAPTISTE VITALIS, OF CLEVELAND, OHIO.

SMOKE-STACK AND ATTACHMENT.

SPECIFICATION forming part of Letters Patent No. 393,194, dated November 20, 1888.

Application filed November 7, 1887. Serial No. 254,566. (No model.)

To all whom it may concern:

Be it known that I, BAPTISTE VITALIS, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Smoke-Stacks and Attachments; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

My invention relates to improvements in smoke-stacks and attachments, designed more especially for puddling-furnaces; and it consists in certain features of construction and in combination of parts hereinafter described, and pointed out in the claims, the object being to render such work more durable and to provide better facilities for renewing the parts.

In the accompanying drawings, Figure 1 is a side elevation, portions being broken away to show the internal construction and to reduce the size of the drawings. Fig. 2 is a reduced plan of the damper, lever, and vane. Fig. 3 is a plan with the damper attachments removed. Fig. 4 is an elevation in section. Flg. 5 is an elevation in detail, hereinafter described. Fig. 6 is an elevation in vertical section of a portion of the damper-spindle and upper journal-box for the same. Fig. 7 is a bottom plan and Fig. 8 a plan of modifications hereinafter described.

A represents the outside casing of the smoke-stack, said casing being made of sheets of metal riveted together in the usual manner, and preferably having attached one or more platforms, A′, and ladders A^2 to accommodate workmen in making repairs, changing dampers, &c. Inside the casing and riveted or bolted to the latter is a series of longitudinal bars, *a*, such bars and casing being slightly separated by means of washers *a′*, these washers being placed on the respective rivets or bolts that secure the bars to the casing. With the bars and casing thus separated the casing is less likely to rust out, and having air-spaces between them these parts (and more especially the casing) are less liable to become overheated. Sometimes one sheet of such casing, or a portion of one or more such sheets, will rust out or become otherwise damaged, while the main portion of the casing remains in good condition; and in such cases bars *a* will hold the casing in place until such times as the casing can be patched.

The brick lining for the smoke stack is made of alternate layers of bricks, B and B′, the former having angular projections *b* at the extremes, and the latter having an annular projection, *b′*, at the center thereof. (See Fig. 3.) When these bricks are laid so as to break joints, the projections *b* and *b′* abut the respective bars *a*, leaving air-ducts b^2 extending lengthwise of the stack, such air-ducts being in open relation with a series of holes, a^2, made in the casing at or near the bottom of the latter. With such construction a free circulation of air is had between the brick-work and casing, whereby the temperature of the stack is greatly reduced, and consequently both brick-work and casing are rendered more durable. The dampers connected with such smoke-stacks have heretofore been the source of much trouble and expense. Such dampers, although made heavy and strong, sometimes weighing several hundred pounds each, are exposed to such intense heat that they are soon burned out, cracked, warped, or broken, so as to become inoperative, such giving out of the damper frequently occurring with little or no warning, and when it does occur a new damper must be quickly substituted or else the charge must be withdrawn from the puddling-furnace. It is no trifling matter to be always ready at a moment's notice to remove in the shortest time possible a hot damper from the top of a hot smoke-stack and place in position a new damper. In view of these difficulties I have devised the following:

My improved damper consists of an outside crowning-cover, C, that closes over the top of casing A, and an inside plate, C′, that closes over the flue and brick-work, these two covers being rigidly connected by means of bolts or studs *c*. Cover C is provided with some suitable device—such, for instance, as an eye-bolt, *c′*—for connecting the cover to lever D. Cover C has also a series of openings, c^2, that are in open relation with chamber C^2 between the covers, and this chamber is in open relation with air-duct b^2. In closing down the damper over the hot stack a free circulation of air is had between the covers that prevents

the inner cover or damper proper from becoming overheated. The ordinary damper for such purpose is exposed to the greatest heat when it is open, and to prevent such exposure I provide the following: The lever for lifting the damper consists, preferably, of two flat bars, D, arranged astride the upright spindle E, with a pin or bolt, *e*, for a fulcrum, the latter passing through holes in both lever-bars and spindle. (See Fig. 2.) Bars D diverge somewhat toward their outer ends and have attached bail F, which latter is connected with rod *f* for operating the damper. The two ends of bail F are provided with eyes, through which rod *f'* passes, this rod also extending through lateral holes made in bars D near the outer ends of the latter. Cross-bar D' is secured to bars D near spindle E. To this cross-bar is pivoted at D^2 vane G, so that the latter may turn laterally the limited distance between bars D. The vane is further supported by rod *f'*, that passes with an easy fit through a hole made in the vane. Spindle E passes with an easy fit through boxes H, only one of the latter being shown. These boxes are clamped between the ends of bands I, that encircle the smoke-stack. The upper box, as shown in Fig. 6, has an annular groove, *h*, for accommodating balls K, and has a shoulder, *h'*. Spindle E is provided with a flanged collar, E', the same having a groove to correspond with groove *h*. The flange *e'* of the collar extends below shoulder *h'* of the box, and lateral pins or set-screws e^2 are fastened in the flange and extend under shoulder *h'*, by which arrangement, when set-screws e^3 (that secure collar E to the spindle) are loosened, the spindle may be removed without disturbing collar E' or the balls between this collar and the box. By means of the ball-bearing just described the spindle is made to turn easily, although bearing the weight of the damper.

E^3 is a sleeve mounted loosely on spindle E to protect the latter from the heat of the flue.

J is a guide-bar, the ends of which are secured to casing A. The central portion of this bar is concentric in plan with the spindle. (See Fig. 3.) The concentric portion of bar J trends upward and terminates in a point, *j*. (See Figs. 1 and 5.) Cross-bar D' has attached a depending arm, *d*, the latter being provided with a laterally-projecting stud, *d'*, on which is journaled roller d^2, this roller extending under bar J. The vane has attached a depending arm, *g'*, the latter being provided with a lateral stud on which is journaled roller g^2, this roller extending above bar J.

When the damper is in position on the stack, roller d^2 fits in the crotch of bar J, and roller g^2 has a slight clearance above point *j*. In drawing down rod *f* to elevate the damper, roller g^2 must follow down the incline of one leg or the other of bar J, by reason of which the lever D will be turned laterally and will carry the damper to the one side of the smoke-stack. In lowering the damper, roller d^2 will travel along the under side of bar J, and in so doing will guide lever D and return the damper back to its place on the stack. In most localities there are prevailing winds that blow in opposite directions—such, for instance, as east wind and west wind—and where such winds prevail the spindle should be set either on the north or on the south side of the stack, so that the prevailing wind will blow crosswise of the vane. In such case the wind would of course swing the vane to the leeward, and in so doing would carry roller g^2 to the leeward of point *j*, so that the damper in being elevated is carried to the windward and is consequently little exposed to the heat. In localities where there are no such prevailing winds the vane can be dispensed with.

With or without the action of the vane the damper by being turned to the one side of the flue escapes the most of the heat. A collar, E^4, is shrunk or otherwise secured to spindle E, and above the collar is mounted on the spindle the crane L, so as to turn freely on the spindle. The crane is preferably made of heavy wrought tubing bent and braced, substantially as shown in Fig. 1. The crane supports tackle-blocks for lifting and lowering dampers and other articles or material. In case it becomes necessary to supply a new damper in place of one that is disabled, if the furnace be in blast, the change as aforesaid should be made as quickly as possible. First, the crane is turned to the one side and the new damper is elevated by means of the tackle, after which the change of dampers requires but a few moments. Next, the old damper, by means of lever D, is elevated and turned to the one side and the crane is swung over the stack and the new damper lowered in its place. The tackles are next employed to sustain the weight of the old damper, thus relieving lever D, which latter is detached from the old damper and fastened to the new one. The old damper can then be lowered and disposed of at leisure.

The outside cover, C, should last for a lifetime, so that in a large mill only one or two extra covers, C, will be wanted, so as to have one or two dampers made up ready for use.

Damper-plate C' may be provided with depending lugs and rim c^3 and c^4, as shown in Fig. 7, for supporting a lining of fire-clay or other suitable material; or, as shown in Fig. 8, the damper-plate may be a skeleton, so that bricks and clay may be packed in the interstices to render such damper-plate more durable.

A hood, M, preferably of sheet metal, may be mounted above the damper to exclude rain and snow from holes c^2, and thus protect the brickwork when the furnace is not in operation.

What I claim is—

1. The combination, with a smoke-stack having a series of cold-air ducts, substantially as indicated, of a damper having a chamber therein, such chamber being in open relation with the cold-air ducts of the smoke-stack when the damper is in its closed position, substantially as set forth.

2. The combination, with a smoke-stack hav-

ing a series of cold-air ducts, substantially as indicated, of a damper having a chamber therein, such chamber being in open relation with the cold-air ducts of the smoke-stack when the damper is closed, ventilating-holes in the upper member of the damper, and a hood for covering such ventilating-holes, substantially as set forth.

3. The combination, with a smoke-stack and damper, of a lever for operating the damper, such damper-lever being fulcrumed to an upright revolving spindle, substantially as set forth.

4. The combination, with a smoke-stack, damper, lever, and spindle, substantially as indicated, of a guide-bar connected with the smoke-stack for engaging the damper-lever or an attachment of the latter, the guide-bar being arranged substantially as indicated, and adapted to swing the damper laterally with the opening and closing of the damper, substantially as set forth.

5. The combination, with a smoke-stack, damper, lever, and spindle, substantially as indicated, of a crane mounted on the spindle and adapted to turn on its axis independent of the movement of the spindle, substantially as set forth.

6. The combination, with a damper, damper-lever, spindle, and guide-bar, substantially as indicated, of a vane pivotally connected with the damper-lever, said vane having a lateral movement between the members of the lever, the damper-lever and vane having respectively attachments for engaging the guide-bar above and below, the arrangement of parts being substantially as described.

In testimony whereof I sign this specification, in the presence of two witnesses, this 17th day of October, 1887.

BAPTISTE VITALIS.

Witnesses:

CHAS. H. DORER,

ALBERT E. LYNCH.