

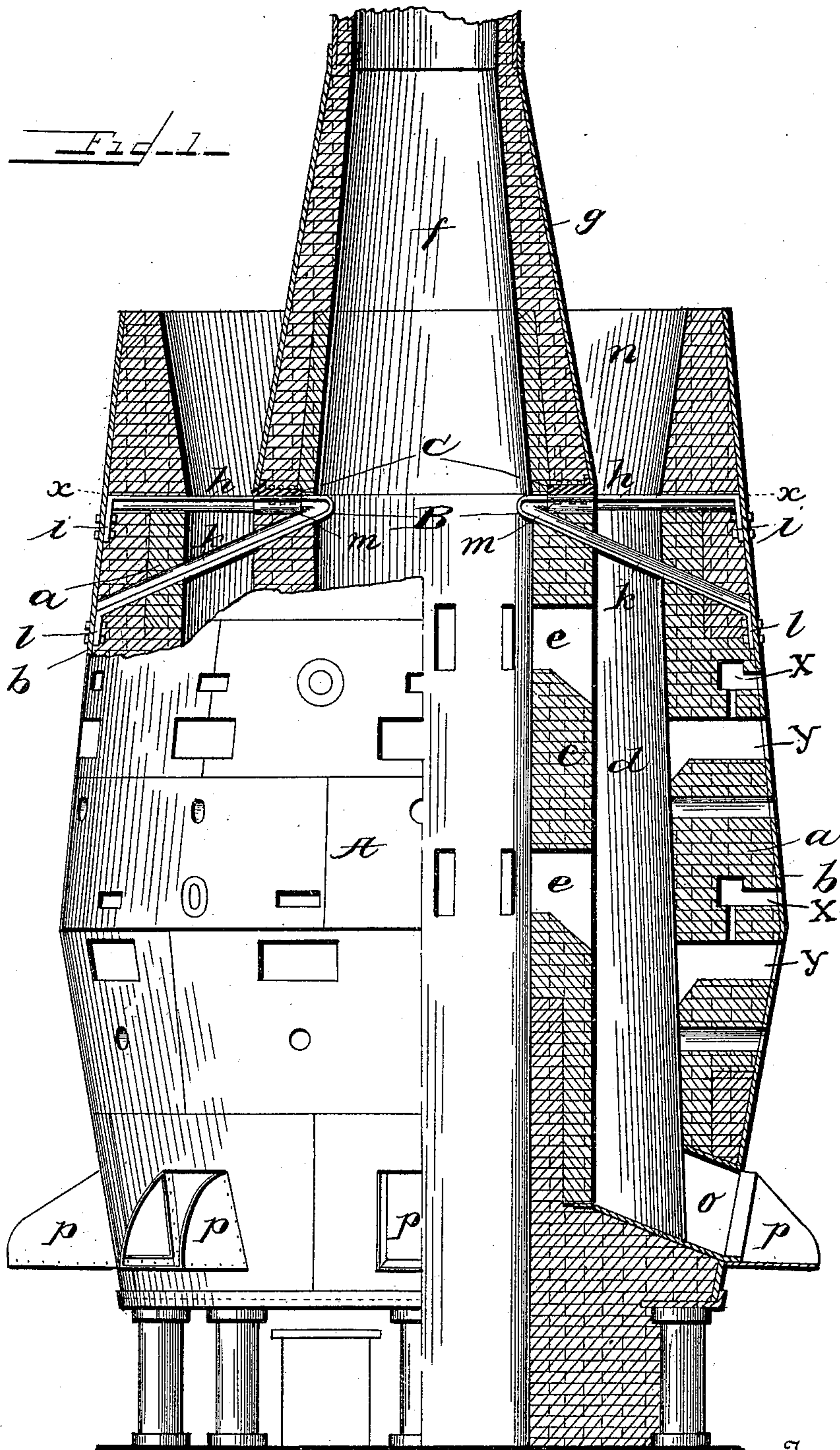
(No Model.)

2 Sheets—Sheet 1.

S. G. VALENTINE.  
KILN.

No. 459,799.

Patented Sept. 22, 1891.



Witnesses

*G. A. Tauberschmidt*  
*J. D. Kingsbury*

Inventor

*S. G. Valentine*  
*By Johnston, Reinold & Dyre*  
Attorneys

(No Model.)

S. G. VALENTINE.  
KILN.

2 Sheets—Sheet 2.

No. 459,799.

Patented Sept. 22, 1891.

Fig. 2

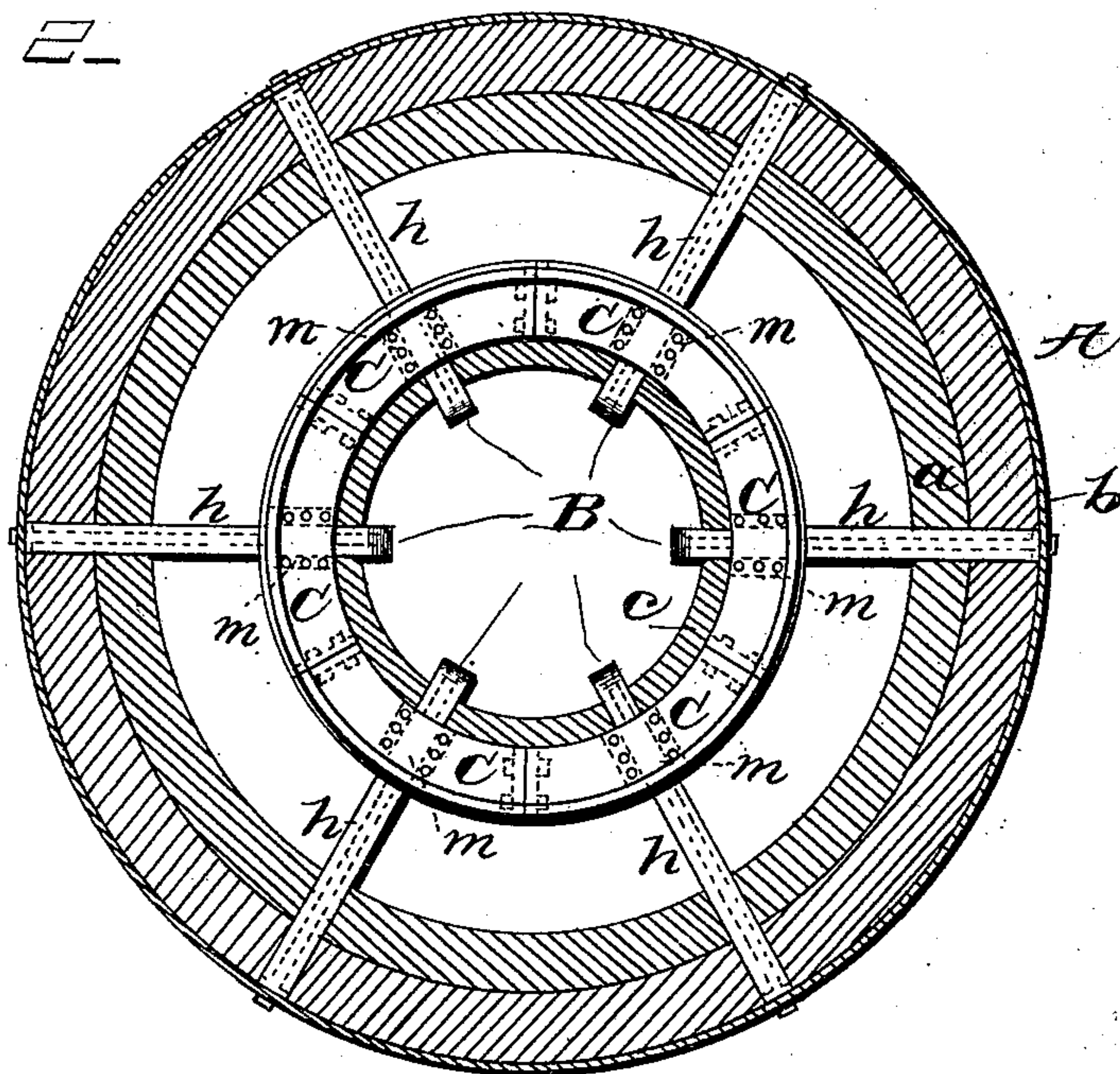


Fig. 3

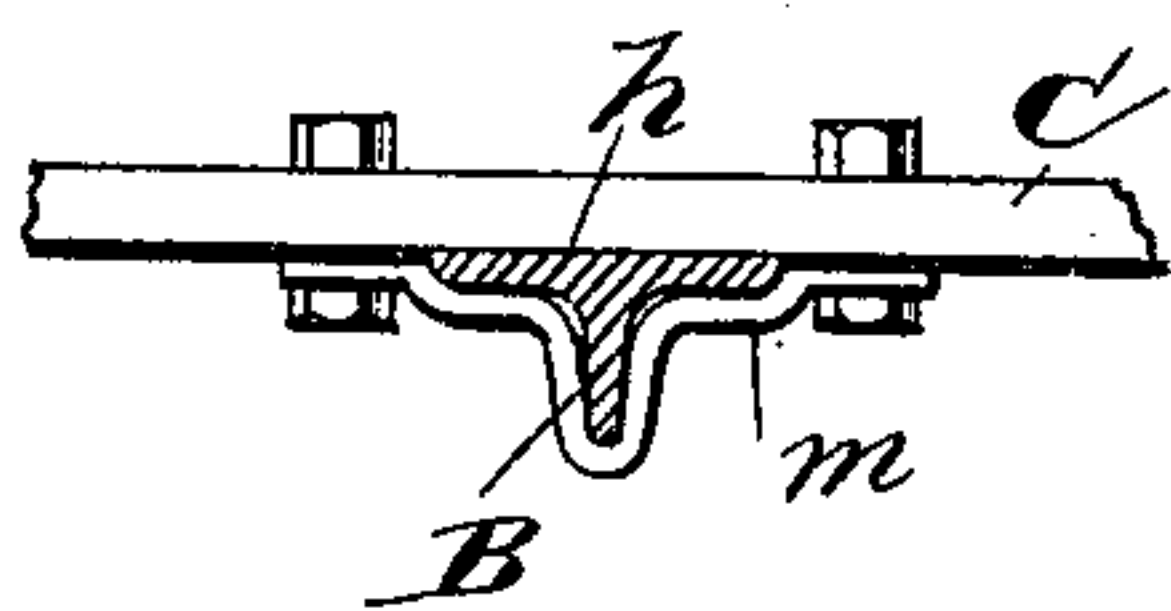
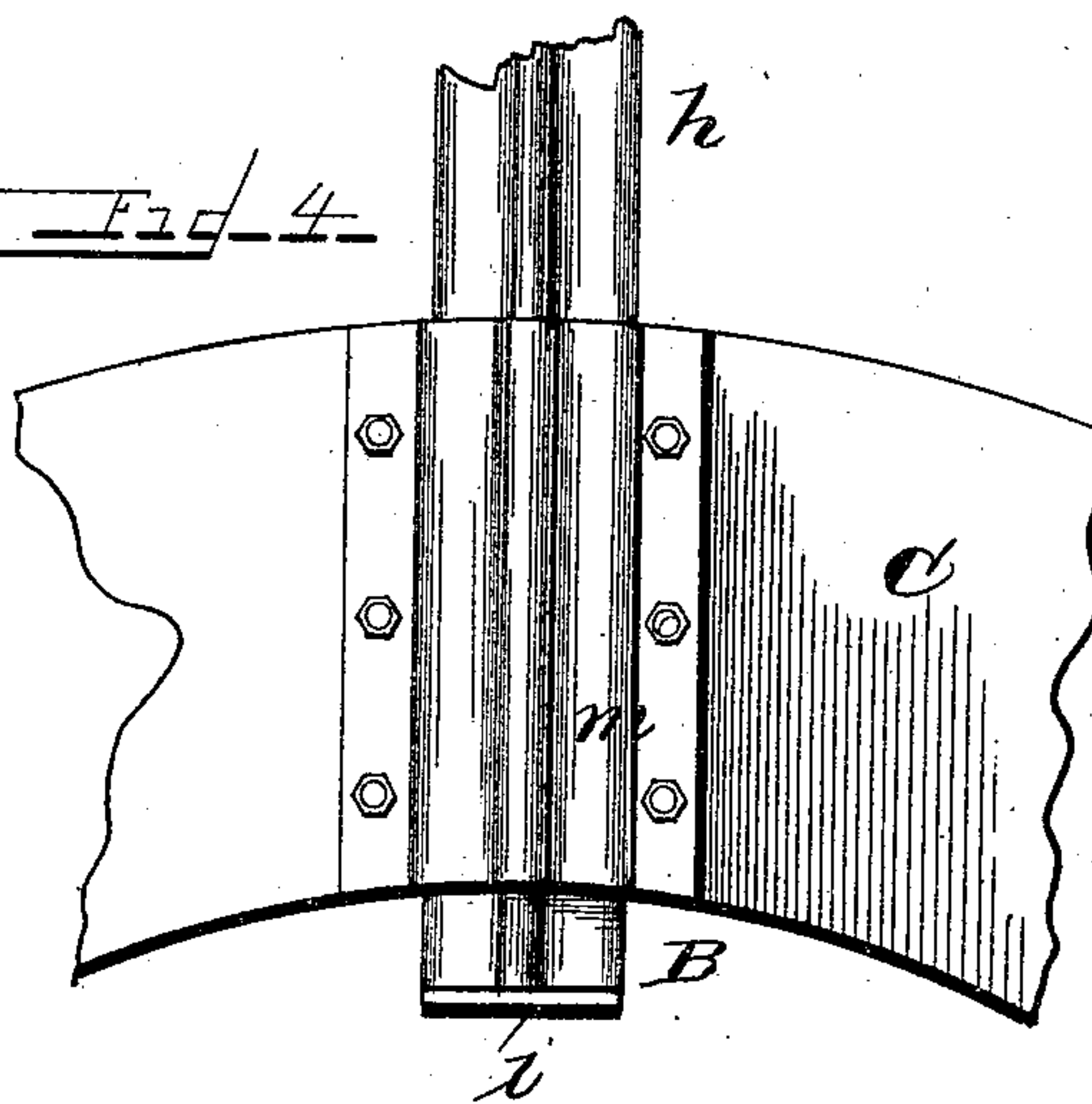


Fig. 4



Witnesses

G. A. Tauberschmitt.  
J. D. Kingsbury.

Inventor

S. G. Valentine  
By Johnston, Reinohl & Dyre  
Attorneys



# UNITED STATES PATENT OFFICE.

STERLING GALT VALENTINE, OF LEBANON, PENNSYLVANIA.

## KILN.

SPECIFICATION forming part of Letters Patent No. 459,799, dated September 22, 1891.

Application filed April 2, 1891. Serial No. 387,391. (No model.)

*To all whom it may concern:*

Be it known that I, STERLING GALT VALENTINE, a citizen of the United States, residing at Lebanon, in the county of Lebanon and State of Pennsylvania, have invented certain new and useful Improvements in Kilns; 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 appertains to make and use the same.

My invention relates to kilns such as are used for roasting ore and analogous purposes, and has especial reference to an improved construction for supporting the chimney or stack above the working chamber of the kiln, whereby the wall of the working chamber may be repaired or removed without interfering with the chimney or stack.

In kilns used for roasting ore in which there is an inner and an outer concentric wall, which forms a working chamber between them, the chimney is formed by a vertical extension or continuation of the inner wall, and in the ordinary construction of this class of kilns the masonry of said inner wall is built up continuously to a proper height to form a chimney, or a bed-plate is laid upon said inner wall at a convenient point and secured in the masonry of the wall by bolts or anchored to subjacent masonry and an iron chimney secured to said bed-plate. In kilns of the construction described the lower part of the chimney is subject to great wear and tear, due to the ore being dumped against it from the top of the kiln and the action of high temperatures, and as a consequence repairs and renewals of said part and the vertical wall below the chimney are frequently required and are found very difficult to accomplish without disturbing the remaining surrounding and superincumbent masonry, owing to the fact that all the masonry above that portion to be repaired is resting upon it. Furthermore, the bolts or anchors to secure the bed-plate are of necessity embedded in masonry subject to excessive wear and frequent repairs and renewals, and is therefore unfit to serve for such a purpose where strength and durability should exist.

My invention has for its object an improved

construction whereby the radical defects enumerated can be avoided and the chimney suspended, so that repairs and renewals can be effected economically and expeditiously.

The invention will be hereinafter described, and more particularly pointed out in the claims.

In the accompanying drawings, which form part of this specification, Figure 1 represents a kiln, partly in side elevation and partly in section; Fig. 2, a plan view on the line *x x*, Fig. 1; Fig. 3, an enlarged cross-section of one of the bracket-supporting plates attached to the lower side of the bed-plate; and Fig. 4, an inverted plan view of a section of the bed-plate, one of the bracket-supporting plates, and a section of a bracket.

Reference being had to the drawings and the letters thereon, A indicates a kiln ordinarily used for roasting ore, and is provided with an outer circular wall *a* of masonry surrounded by a sheet-metal jacket or casing *b*, through both of which are formed the usual ports and discharge-passages and spouts, an inner circular wall *c*, also of masonry, which extends from the base or foundation to the top of the kiln, and between the walls *a c* is formed an annular working or roasting chamber *d*. The wall *c* is provided with the usual passages, as *e*, for the escape of gases and waste products of combustion, and is surmounted by a chimney or stack *f* of masonry incased in a sheet-metal jacket or casing *g*.

The kiln may be heated with fuel fed at the top of the working-chamber, or it may be supplied with gas from any source through the flues X and fire-arches Y, the gas being conducted through suitable mains, (not shown,) which communicate with the flues X.

B indicates a series of brackets, each consisting of a horizontal bar *h*, having a flange *i* at the outer end, and an angular bar *k*, having a flange *l* at its outer end. The brackets are secured by their flanges *i* and *l* to the outer jacket or casing *b*, and are embodied in the masonry of the wall *a* at their outer ends, and the angular bar *k* is embedded at its inner end in the masonry of the wall *c*.

Upon the inner ends of the horizontal arms or bars of the brackets B is secured a bed-plate C by means of bracket-plates *m*, which



embrace the bar *h* loosely and are secured to the under side of the plate *C*. By making the plates *m* fit loosely around the bar *h* any irregularities in the walls *a c* are provided for, and any expansion and contraction of the walls or the metal under varying degrees of temperature admitted without injury to the walls.

Upon the upper surface of the bed-plate *C* is built and supported the chimney *f* of masonry or a metallic chimney or casing *g*, or both, as may be desired, for the purposes for which the kiln is used.

In the practical use of this class of kilns the base of the stack or chimney and the wall *c* are subject to the wear of the ore in its passage from the receiving-chamber *n*, into which the ore is dumped, to the lower end of the chamber *d*, from which it is withdrawn through the passage *o* and chutes *p*, and to the deteriorating or destructive effects of the high degree of heat maintained in said chamber to roast the ore.

By the construction shown the parts subject to excessive wear and destruction by heat may be repaired or removed by removing the worn portions or the whole wall under the bed-plate *C* without disturbing any of the masonry above the bed-plate, the weight of the chimney at such times being borne by the casing *b* and outer wall *a*.

It is obvious that my invention may be applied to any kiln having a working chamber between an inner and an outer wall without respect to the contour of the walls, the chimney or stack of which kiln is above the inner wall of the kiln.

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

1. In a kiln, an outer wall provided with suitable air and discharge passages, an inner wall extending from the base to the top of kiln and provided with suitable draft-openings, a working chamber formed by said outer and inner walls, a chimney surmounting the inner wall, a bed-plate upon which said chimney rests, and brackets embedded in the masonry of the outer wall, supporting the bed-plate.

2. In a kiln, an outer and an inner wall, the former provided with suitable heat-conducting air and discharge passages and the latter with draft-openings, a working chamber the sides of which are formed by said walls, a chimney surmounting the inner wall, a bed-plate embedded in said wall and upon which the chimney rests, and brackets sup-

porting the bed-plate and the chimney and embedded in the masonry of the outer wall.

3. In a kiln, an outer and an inner wall, a metallic casing surrounding the outer wall, suitable passages through the casing and the outer wall and draft-passages through the inner wall, a working chamber the sides of which are formed by said outer and inner walls from the bottom to the top of the kiln, a chimney surmounting the inner wall, a bed-plate supporting the chimney, and brackets attached to the bed-plate and extending through the outer wall to the metallic casing.

4. In a kiln, an outer and an inner wall of masonry provided with suitable passages and forming the sides of an interposed working chamber, said sides extending from the bottom to the top of the kiln and arranged to confine the material operated upon between said walls from the time it is introduced into the working chamber until discharged therefrom, a chimney surmounting the inner wall, and a bed-plate and brackets under the bed-plate and embedded in the outer wall for supporting the chimney above the inner wall.

5. In a kiln, an outer and an inner wall provided with suitable discharge and draft passages, a working chamber between said walls, a chimney surmounting the inner wall, a bed-plate supporting the chimney, and brackets movably secured to the bed-plate to permit expansion and contraction of the walls and supported by the outer wall.

6. In a kiln, an outer and an inner wall provided with suitable passages and the latter extending from the base to the top of the kiln, a working chamber between said walls, a chimney surmounting the inner wall, a bed-plate supporting the chimney, and brackets loosely attached to the under side of the bed-plate and embedded in the masonry of the outer wall.

7. A kiln consisting of an outer and an inner wall provided with suitable passages, a metallic casing surrounding the outer wall, a working chamber between said walls, a bed-plate, brackets having a flange at the end of each arm, secured to the casing, plates for attaching the bed-plate to the brackets, and a chimney surmounting the inner wall and supported upon the bed-plate and the brackets.

In testimony whereof I affix my signature in presence of two witnesses.

STERLING GALT VALENTINE.

Witnesses:

B. RUTH,  
CYRUS HEVERLING.

It is hereby certified that in Letters Patent No. 459,799, granted September 22, 1891, upon the application of Sterling Galt Valentine, of Lebanon, Pa., for an improvement in "Kilns," an error appears in the printed specification requiring correction, as follows: In line 26, page 2, the word "removed" should read *renewed*; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed, countersigned, and sealed this 29th day of September, A. D. 1891.

[SEAL.]

CYRUS BUSSEY,  
*Assistant Secretary of the Interior.*

Countersigned:

W. E. SIMONDS,  
*Commissioner of Patents.*