No. 844,297. PATENTED FEB. 12, 1907.

J. V. BOLAND.

CHIMNEY.

APPLICATION FILED JAN. 26, 1906.

2 SHEETS—SHEET 1.

Fig. 1.

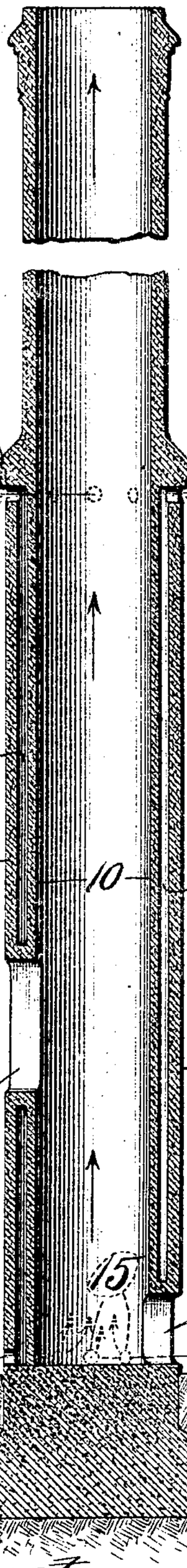


Fig. 2.

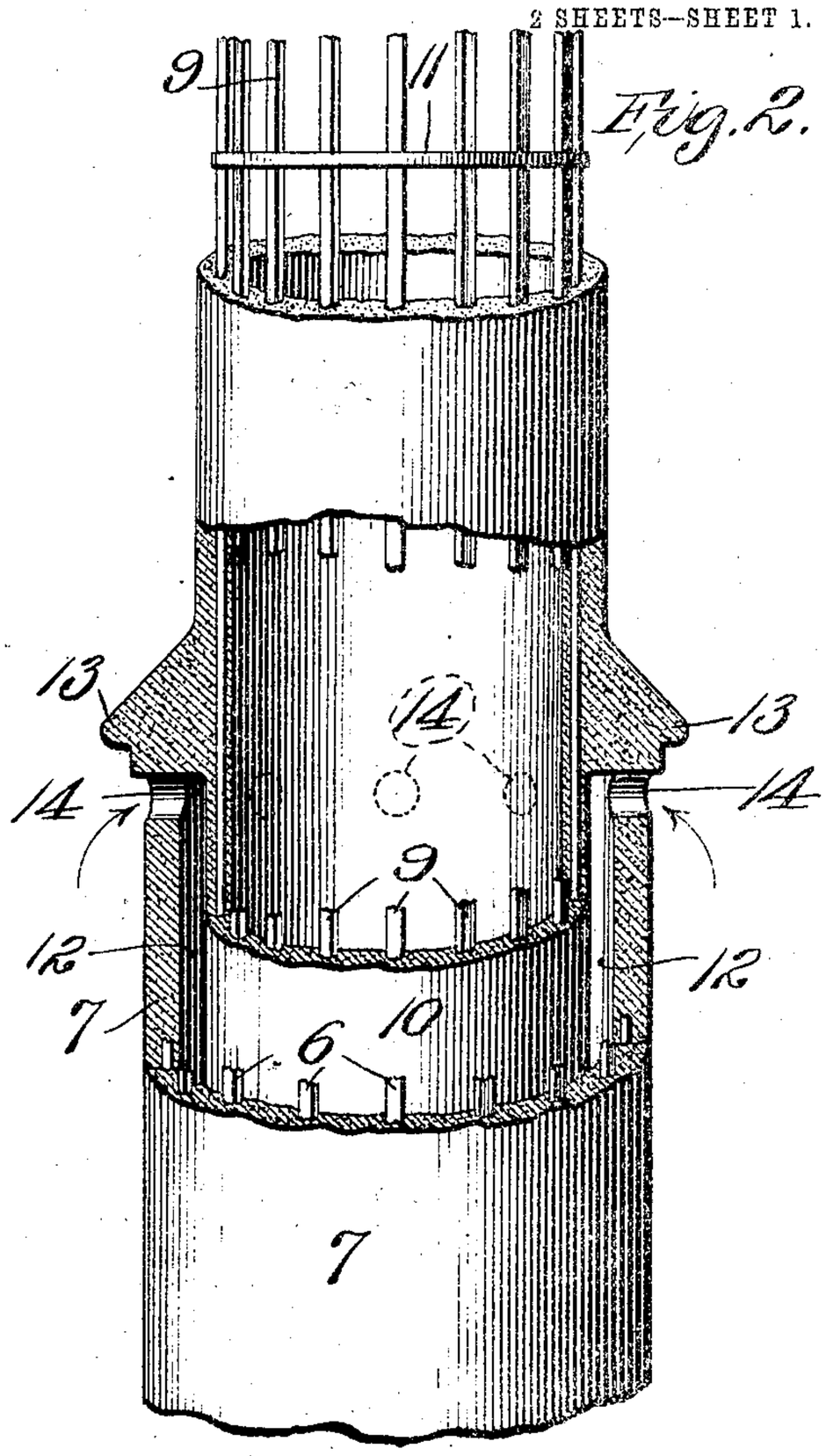
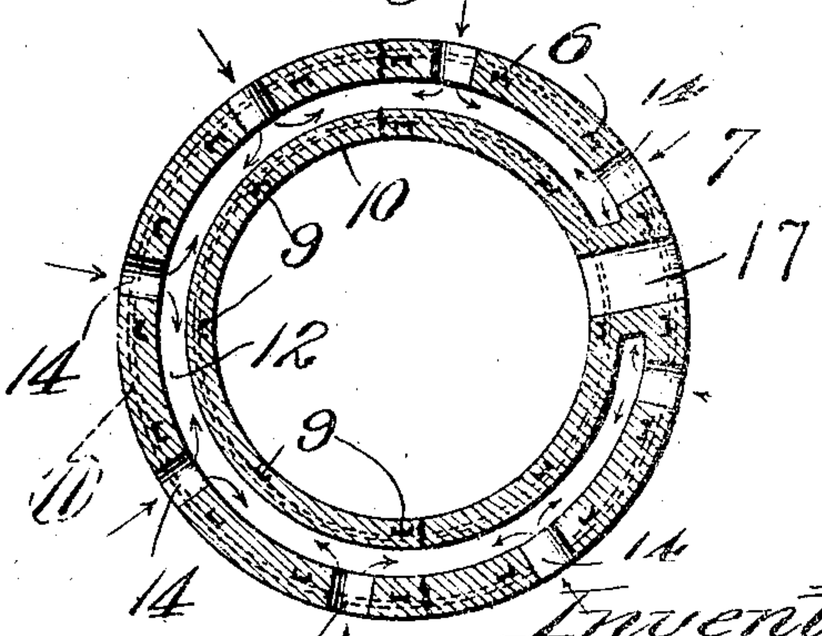


Fig. 3.



Witnesses
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2 SHEETS—SHEET 2.

Fig. 4.

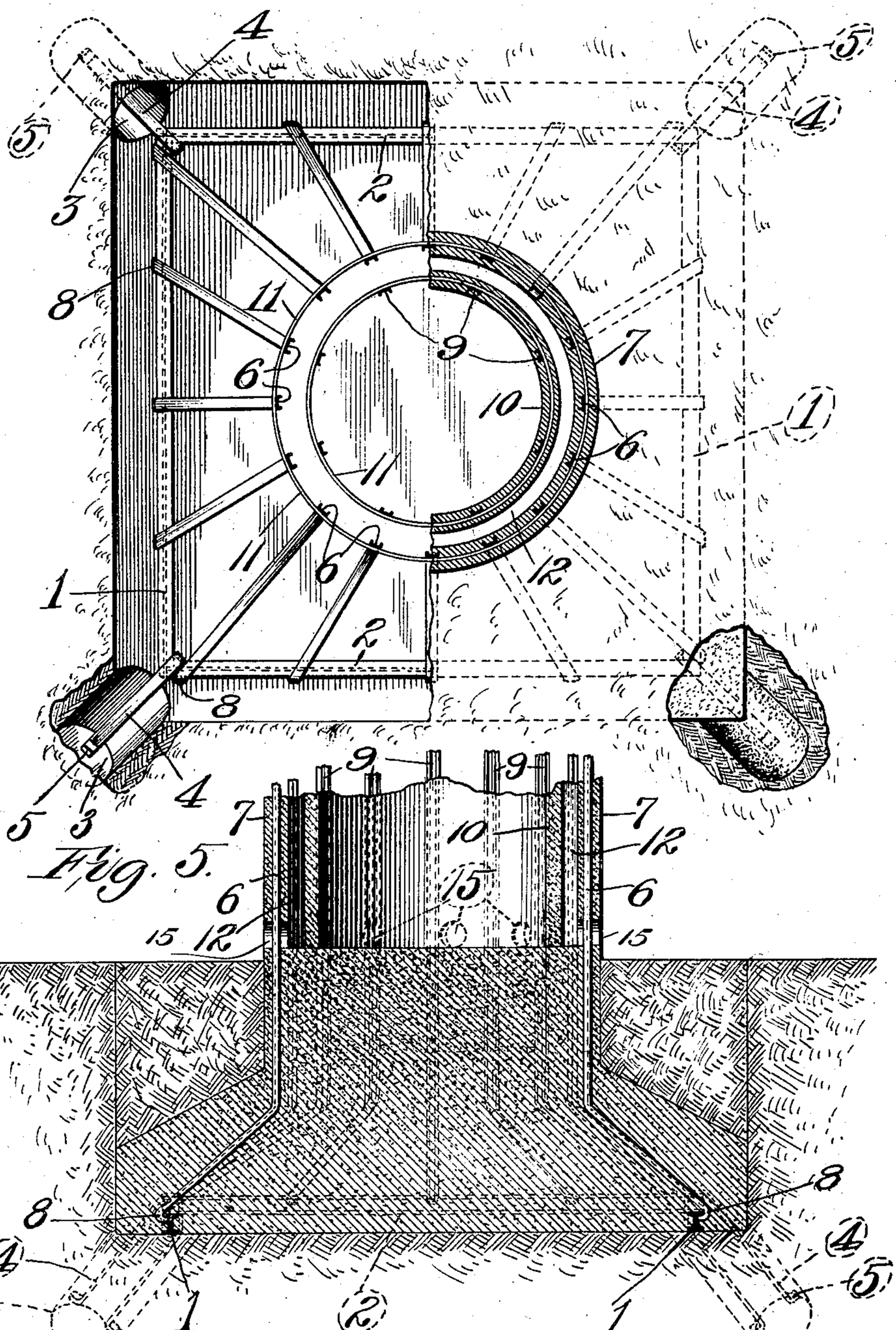

Fig. 5.

Attest:
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UNITED STATES PATENT OFFICE.

JOHN V. BOLAND, OF ST. LOUIS, MISSOURI.

CHIMNEY.

No. 844,297. Specification of Letters Patent. Patented Feb. 12, 1907.

Application filed January 26, 1906. Serial No. 298,025.

To all whom it may concern:

Be it known that I, JOHN V. BOLAND, a citizen of the United States, residing at St. Louis, Missouri, have invented a new and useful Chimney, of which the following is a specification.

This invention relates to chimneys, and consists in the general construction and arrangement of the chimney, which comprises a base portion reinforced by anchored metal beams to which are connected the inclined lower ends of vertical metallic reinforcements embedded in concrete, the lower portion of the chimney comprising, preferably, two concentric walls, between which is an air-space having access to the exterior near the top and at the bottom thereof. This arrangement of the air-space and the draft and discharge outlets therefrom, arranged, respectively, near its upper and lower ends, facilitates the circulation of the air-currents and enables a cooling-current constantly to pass therethrough.

With these various features of construction in view my invention consists also of additional improvements, which, together with their advantages, are herein fully described.

In the accompanying drawings, which form part of this specification, Figure 1 is a vertical sectional view of a chimney constructed in accordance with my invention. Fig. 2 is a view, partially broken and partially in section, of one portion of the chimney. Fig. 3 is a sectional view on the line 3 3 of Fig. 1 looking downward. Fig. 4 is a plan or diagrammatic view of the reinforcements, a part of the concrete-work of the chimney being shown in section. Fig. 5 is an enlarged vertical sectional view of the base of the chimney.

In the construction of a chimney of this type within an excavation for the base are laid two metal beams 1, and with their ends resting upon said beams 1 are two other beams 2, thereby forming a rectangular frame. These beams are of structural metal and are some distance from the walls of the excavation, so that when the concrete is poured in said beams are entirely embedded therein. They are preferably of I-beam construction, though that type is not absolutely essential.

An excavation 3 is made at each corner of the base-frame formed by the beams 1 and 2, said excavations extending obliquely outward from the corners. Over each corner of the base-frame so formed by said beams 1 and 2 is passed an anchor 4. These anchors may be of any preferred design and I have illustrated only one form, which consists of a substantially U-shaped strap, between the legs of which are the corners of the base-frame—that is to say, the ends of the beams 1 and 2. The extremities of the legs of these anchors are angular, as indicated at 5. The excavations are filled with concrete after the anchors are positioned, as also is the base excavation after the metal reinforcements are positioned.

An annular series of channel-beams 6, preferably with their channels inward, is provided for the outer wall 7 of the lower part of the chimney, the lower extremities extending obliquely outward and having hooks extending around under the flanges of the I-beams 1 and 2, as shown at 8, thereby firmly connecting them to the base-frame, which latter is strengthened by the anchors 4. Similarly, channel-beams 9 are provided and anchored for the reinforcement in the inner wall 10, all of the channel-beams of each series being embedded in the concrete base. The superstructure having these reinforcing-beams embedded therein and the lower ends of the beams fastened to the base-frame to prevent slipping of the said reinforcing-beams is a strong structure, which will most effectively withstand vibrations of the earth and the forces of storms and other damaging agencies. Obviously a chimney so constructed is less liable to crack or yield to the aforesaid destructive forces than one not so strongly reinforced by beams attached to the base. These beams should be of different lengths for best results. Each series of beams is encircled at intervals by rings 11, which are positioned as the concrete is built up and located at convenient distances from each other. When the height of any of the beams is reached, others are placed successively in position until the chimney is built to the desired altitude. The final result is a strongly-reinforced monolithic chimney structure.

The air-space 12 separates the outer wall 7 from the inner wall 10, the upper extremity of the double-wall portion being marked by an annular rib 13. Just blow this rib there is a series of air-holes 14, communicating with the air-space and admitting cool air thereinto. At the base of the outer wall 10 a series of air-holes 15 leads into the air-space,

so that there may be a continuous circulation of air through the air-space around the inner wall. The general result is a free circulation of cool air around the inner wall of the chimney to minimize the destructive effects of the heated products of combustion upon the concrete structure.

The opening 16 affords ingress for the smoke through any suitable flue or conduit leading to the furnace. For removing the deposits which collect in the bottom of the chimney an opening 17 is formed near the base, which may be kept closed by any known closure.

I am aware that there may be variations from the foregoing description within equivalent limits and do not, therefore, restrict myself to inessential details; but

What I do claim, and desire to secure by Letters Patent, is—

1. A chimney comprising a base-frame formed with a series of metal beams the ends of certain of which beams rest upon others thereof, metallic parts fastening the ends of said metal beams together, an inner annular series of upright channel-beams, means to attach the lower ends of said beams to said base-frame, an outer annular series of upright channel-beams, means to attach their lower ends to said base-frame, and chimney-wall structure comprising two concentric concrete walls embedding said two series of channel-beams with an air-space between said two walls opening to the exterior at its upper and lower ends, and said two walls uniting and forming a single wall above the air-space, substantially as specified.

2. In a chimney, the combination of a base-frame comprising a number of metal beams arranged transversely of each other and with the ends of certain of said beams resting upon others thereof, metallic anchors attached to said metal beams and extending below the same, an annular series of upright metal beams, means to attach their lower ends rigidly with said base-frame, and a monolithic concrete structure embedding all of said parts, substantially as specified.

3. In a chimney the combination of a base-frame comprising a rectangular series of metal beams, metallic members attached to said beams and extending below the same, metallic uprights having their lower ends attached to said metal beams, and a monolithic concrete structure embedding all of said parts, substantially as specified.

4. In a chimney, a base-frame comprising a rectangular series of metal beams and metallic devices uniting the ends of said metal beams and projecting downwardly therefrom, two annular concentric series of metallic uprights having their lower ends fastened to said metal beams, solid concrete embedding the entire base-frame and the lower ends of the metallic uprights, and chimney-wall structure comprising two concentric concrete walls embedding said two series of metallic uprights with an air-space between said two walls opening to the exterior at its upper and lower ends and said two walls uniting and forming a single wall above the air-space; substantially as specified.

5. A chimney comprising a series of metal beams arranged in the form of a frame, metallic devices fastening the ends of said metal beams together and projecting obliquely outward therefrom, an annular series of upright metal beams, means for fastening the lower ends of said upright metal beams to the said beams forming a frame, a series of rings inclosing said annular series of beams, and a monolithic concrete structure embedding all of said parts, substantially as specified.

6. A chimney comprising a base-frame formed with a series of metal beams arranged transversely with the ends of certain of said beams resting upon others thereof, a metallic U-shaped member arranged over the ends of said beams and extending obliquely outward therefrom, concrete embedding said members, an inner annular series of upright metal beams, means for fastening the lower ends of said beams to said base, an outer annular series of upright metal beams of different lengths, rings encircling each series of upright beams, and monolithic concrete structure embedding all of said parts, substantially as specified.

7. In a chimney, the combination of a base-frame comprising a series of metal beams, metallic uprights, means for fastening the lower ends of said uprights to said beams, and a monolithic concrete structure embedding said base-frame and said uprights, substantially as specified.

8. The combination with a monolithic concrete chimney comprising a concrete base and two annular concentric concrete walls rising above the base with an air-space between said walls opening to the exterior at its upper and lower ends and a single wall resting upon and rising above said two walls, of a series of substantially horizontal beams embedded in the base, an outer annular series of upright metal beams embedded in the said outer wall, means for fastening the lower ends of said upright metal beams to said beams in the base, and an inner annular series of upright metal beams embedded in said inner wall, substantially as specified.

9. A chimney comprising a base-frame formed with a series of metal beams, an inner annular series of upright metal beams, means fastening the lower ends of said upright metal beams and the base-frame together, a concrete base embedding the base-frame and the lower ends of the upright beams, an imperforate concrete wall rising above said base and embedding said upright beams, an outer series of upright metal beams having heir

lower ends embedded in the concrete base, an outer concrete wall rising above said base and embedding said outer upright beams and forming an air-space between said outer and inner walls, and having openings at the upper and lower ends of said air-space, and a single wall rising above said two walls, substantially as specified.

10. A chimney comprising a base-frame formed with a series of substantially horizontal metal beams, metallic anchors connected to and extending downward from said metal beams, an outer annular series of upright metal beams having their lower ends attached to said base-frame, rings encircling said outer series of metal beams, an inner annular series of upright metal beams having their lower ends attached to said base-frame, rings encircling said inner series of metal beams, a concrete base embedding said base-frame and the lower ends of said upright beams, an imperforate inner concrete wall embedding said inner series of metal beams, a concrete wall embedding said outer series of metal beams and forming an air-space between said two walls which opens to the exterior through said outer wall at its upper and lower ends, metal beams extending above said walls, metallic rings encircling said metal beams, and a single concrete wall rising above said two walls and embedding said last-named metal beams, substantially as specified.

11. The combination with a chimney comprising a base and two concentric walls rising above the base with an air-space opening to the exterior at its upper and lower ends and a single wall resting upon and rising above said two walls, of a series of substantially horizontal beams embedded in the base, a series of metal beams embedded in said inner wall and means for fastening the lower ends of said uprights to said beams in the base to strengthen the chimney, substantially as specified.

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

JOHN V. BOLAND. [L. S.]

Witnesses:
J. D. RIPPEY,
FRANK J. MCCASLIN.