

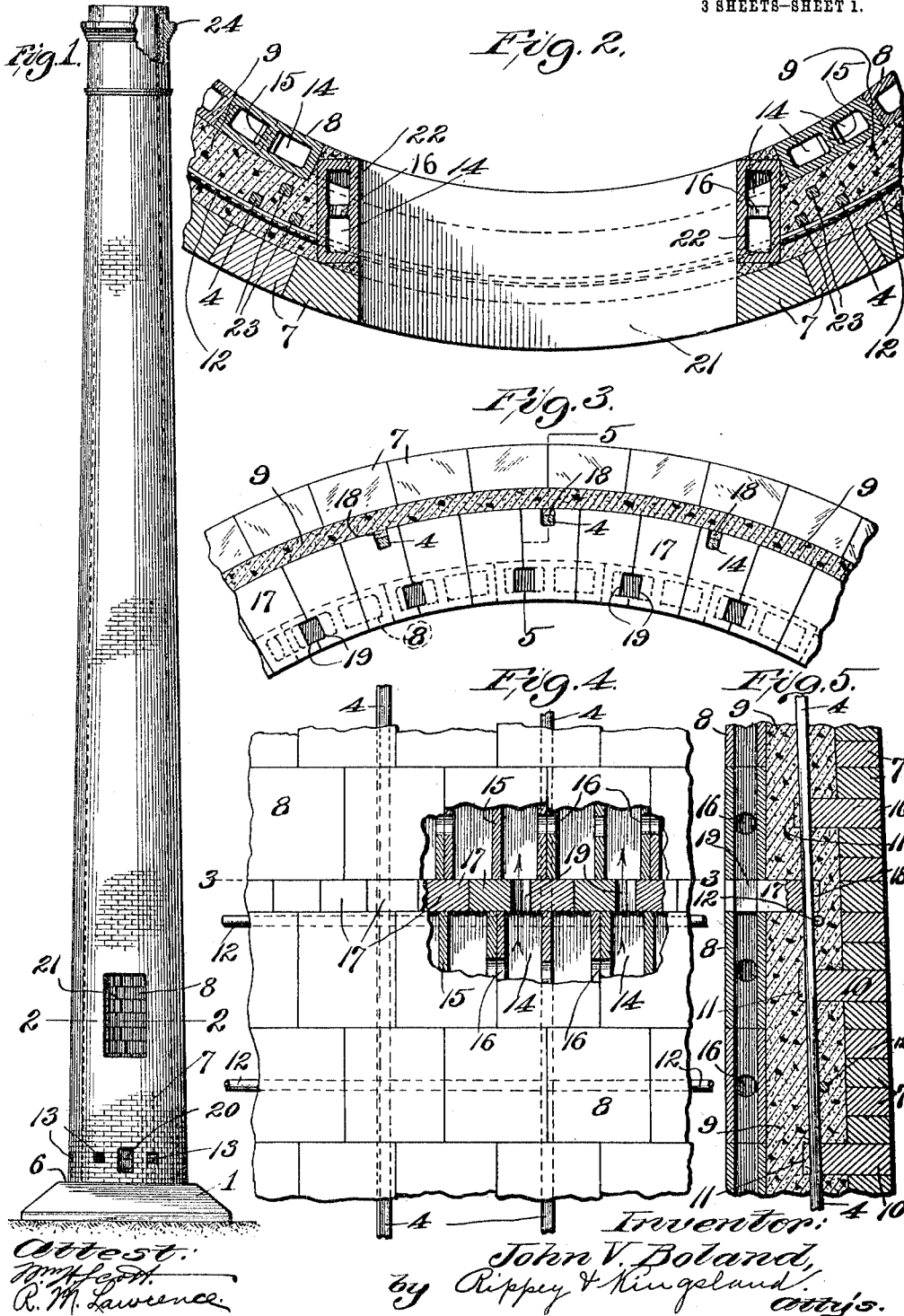
J. V. BOLAND.
CHIMNEY.

APPLICATION FILED SEPT. 29, 1913.

1,107,883.

Patented Aug. 18, 1914.

3 SHEETS—SHEET 1.



Attest:
R. M. Lawrence

Inventor: John V. Boland,
by Rippey & Kingland attys.

J. V. BOLAND.

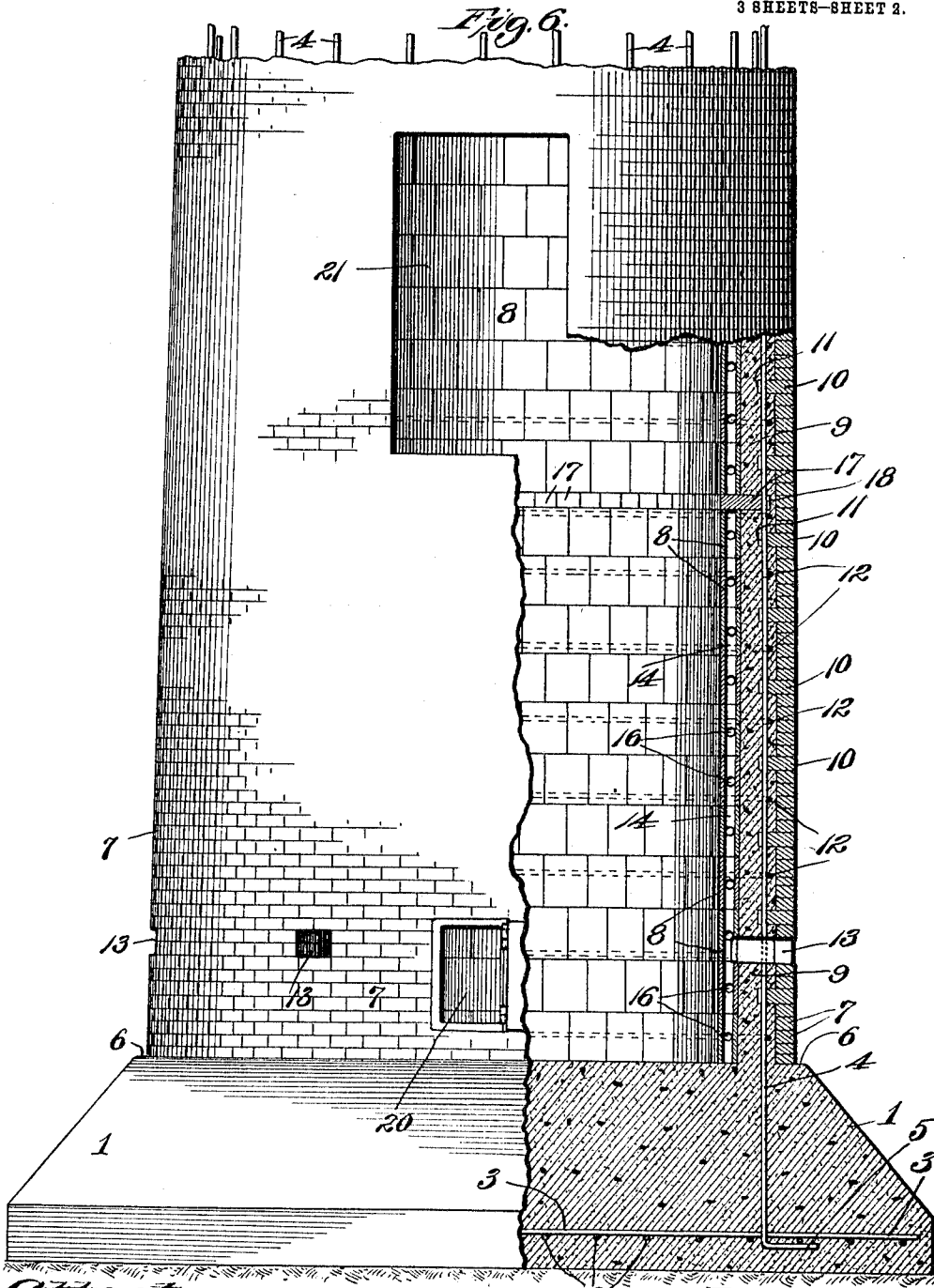
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3 SHEETS-SHEET 2.



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CHIMNEY.

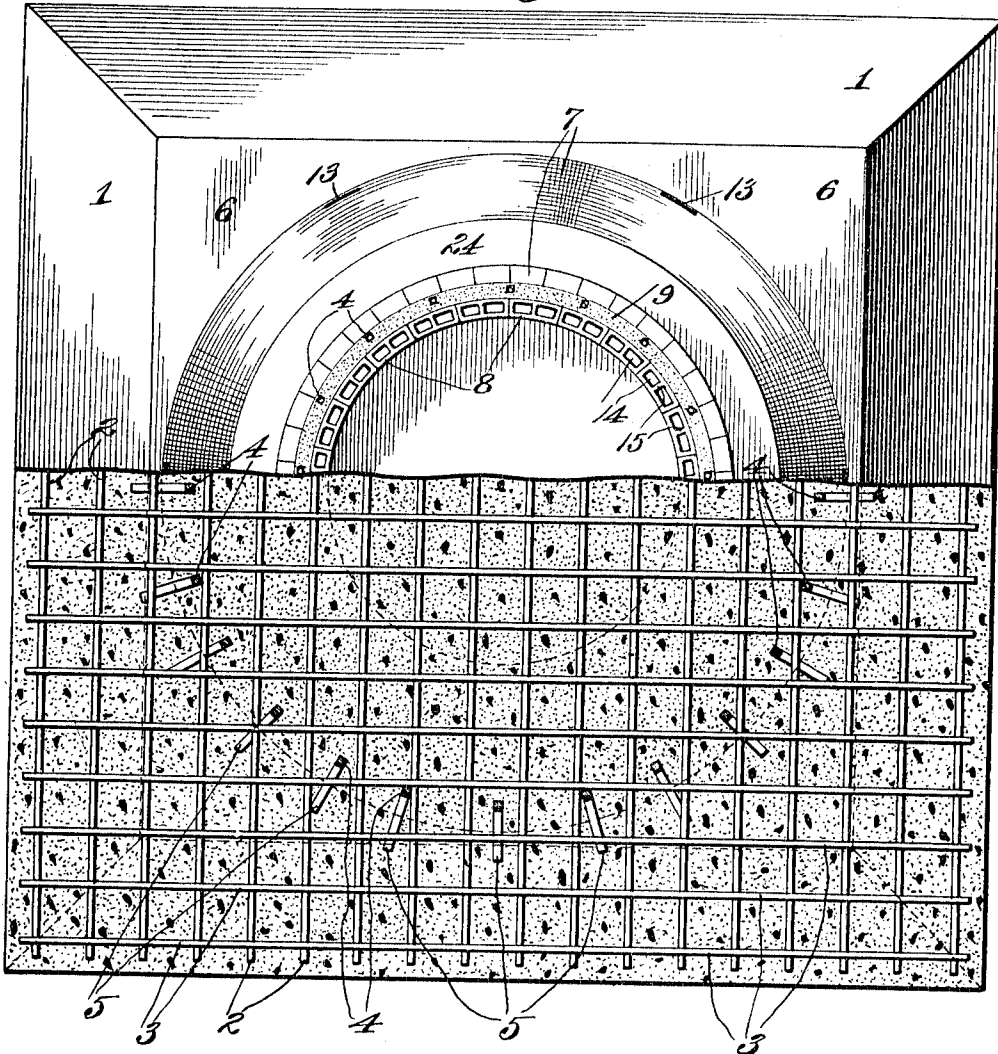
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3 SHEETS-SHEET 3.

Fig. 7.



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UNITED STATES PATENT OFFICE.

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

CHIMNEY.

1,107,883.

Specification of Letters Patent.

Patented Aug. 18, 1914.

Application filed September 29, 1913. Serial No. 792,403.

To all whom it may concern:

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

This invention relates to chimneys, and has special reference to large chimneys of the type employed by factories, smelters, power plants and other industrial concerns.

An object of the invention is to provide a chimney comprising a base or foundation arranged to support the chimney structure proper, and a chimney wall structure rising above said base or foundation and comprising a lining formed of hollow fire brick, the chambers of which form a continuous air passage from the bottom to the top of the chimney, an outer wall surface composed of brick or other similar building material, and a concrete filler between said lining and said outer wall surface, with provision for locking the lining and the outer wall with the concrete, whereby the entire chimney structure is strengthened.

Another object is to provide an improved chimney comprising an outer wall surface which may be composed of ordinary building brick, and a lining composed of hollow fire brick arranged to form a continuous passage from near the bottom to the top of the chimney to enable the air to circulate and pass to cool the chimney, in combination with a concrete body or filler between said outer wall and said lining, and reinforcing rods embedded in said concrete.

A further object is to provide an improved chimney comprising a concrete filler or body, reinforcing rods embedded in said concrete, an outer wall portion composed of brick or the like and having headers at intervals extending into and embedded within the concrete, and a lining composed of hollow fire brick forming continuous air passages from near the bottom to the top of the chimney, and headers arranged at intervals in said lining extending into and embedded in the concrete; whereby both the lining and the wall portion are rigidly united with the concrete by the bonding action of the concrete upon said headers.

Other objects will appear from the following detailed description, reference being made to the accompanying drawings in which I have illustrated a preferred embodiment of my invention, and in which—

Figure 1 is an elevation of a chimney con-

structed in accordance with my invention. Fig. 2 is an enlarged sectional view substantially on the line 2—2 of Fig. 1. Fig. 3 is a sectional view on the line 3—3 of Fig. 4. Fig. 4 is a view showing a portion of the lining, a part of the inner walls of the fire brick being broken away to disclose the arrangement of the communicating chambers, and the openings through the headers by which continuous passages are formed from near the bottom to the top of the chimney. Fig. 5 is a vertical sectional view on the line 5—5 of Fig. 3. Fig. 6 is an elevation partially in section of the lower part of the chimney and the base illustrating in detail the arrangement of the reinforcing rods in the chimney wall structure and in the base or foundation. Fig. 7 is a view which is half in plan of the complete chimney and foundation, and a half is in section through the foundation illustrating the arrangement of the reinforcements embedded in the concrete.

The base or foundation 1 of the chimney is constructed by first providing a layer of concrete, which may be below the surface of the ground and within an excavation if desired. A series of reinforcing rods or beams 2 is placed upon the layer of concrete, and another series of rods or beams 3 is placed transversely upon the rods or beams 2. A vertical series of rods 4 is provided with laterally extended portions 5 on their lower ends, which laterally extended portions extend under the rods or beams 2, thereby connecting or interlocking the vertical reinforcements with the reinforcements in the base or foundation. After the reinforcements have thus been placed the base or foundation is completed by additional quantities of concrete placed upon the preliminary layer, so as to embed the base reinforcements, as well as the lower ends of the vertical reinforcements.

The base or foundation may be of any suitable dimensions and shape, and is finished off with a ledge 6. Upon the ledge 6 an outer wall portion 7 is erected, for the chimney proper. The wall portion 7 may be composed of ordinary building brick, and constitutes the outer surface of a chimney. An inner wall portion or lining 8 is also built upon the base or foundation, and is concentric with the brick wall. The brick wall and the lining are separated by suitable space into which the upper portions of the vertical reinforcing rods 4 extend. After

the brick work 7 and the lining 8 have been erected to a suitable height the intervening space is filled with concrete, so as to form a concrete filler or body 9, which is monolithically united with the base or foundation 1 and which embeds the reinforcing rods 4 above the base or foundation. At suitable intervals, say eight or ten inches apart, the brick structure 7 is varied to provide headers 10 which extend into and have their inner ends embedded in the concrete wall structure 9 so as to form a strong and rigid connection and union between the brick and the concrete portions of the wall. The headers 10 extend inwardly beyond the reinforcing rods 4, and those which encounter the reinforcing rods are provided with notches 11, (Fig. 5), to receive the rods. The series of rods 4 are encircled between each adjacent row of headers 10 by an encircling rod or bail 12, which are embedded in the concrete, and receive many of the stresses of the chimney. Near the bottom of the chimney a series of openings 13 are formed through the brick and concrete wall structure, said openings communicating with and opening into the chambers in the hollow fire brick forming the lining 8. Thus, cooling currents of air may enter the air chambers near the bottom of the chimney and circulate upwardly, passing out of the open air chambers at the top of the chimney, thereby cooling and preserving the fire brick lining.

Each of the fire brick in the lining is preferably composed of two vertical chambers 14 formed by a vertical partition 15. The fire brick are arranged to break joint, as illustrated in Fig. 4, in such arrangement that the chambers form continuous passages. In some cases, part of the walls and partitions of the fire brick may be broken out, as indicated at 16 in Fig. 4, in order to provide lateral communication and thereby enable the air to have free passage and circulation entirely around the chimney lining. At intervals the structure of the lining is varied to provide headers 17, which extend outwardly and have their outer ends embedded in the concrete portion 9 of the wall. The headers 17 extend between adjacent rows of headers 10, and are provided with notches 18 to receive the rods 4. Openings 19 are formed through the headers 17, and constitute continuations of the chambers in the fire brick above and below said headers for free circulation of the air.

Near the bottom of the chimney an opening 20 is formed, (which may be kept closed by a suitable door if desired), which constitutes a passage through which access may be had to the interior of the chimney for the

purpose of removing accumulations from the bottom of the chimney, etc. At a suitable height above the base or foundation an opening 21 is provided for connection with a flue or smoke pipe. The wall of the opening 21 is formed by hollow fire brick 22 the chambers of which communicate with chambers 14 in the fire brick forming the lining, so that the cooling air may pass in proximity to the wall of the smoke inlet. Additional vertical reinforcing rods 23 are embedded in the concrete at the sides of the opening 21, in order to provide strong reinforcement for the chimney wall structure adjacent to said opening.

An ornamental reinforcing ledge 24 is provided near the top of the chimney. The chimney tapers gradually from the bottom to the top, and is strengthened by said construction.

I am aware that there may be variations within equivalent limits without departure from the scope of the invention.

What I claim and desire to secure by Letters Patent of the United States is:

1. A chimney comprising a concrete base, an annular series of reinforcing rods having their lower ends embedded in said base, and a concrete wall in monolithic connection with said base and embedding said rods, in combination with a fire brick lining supported on said base, an outer brick wall portion encircling said concrete wall, headers arranged at intervals in said outer brick wall portion and having their inner ends embedded in said concrete wall, and rods encircling said annular series of rods between said headers, substantially as described.

2. A chimney comprising a concrete base, an annular series of vertical rods having their lower ends embedded in said base, a concrete wall embedding said rods, a lining composed of hollow brick and headers arranged at intervals and extending into said concrete wall, passages through said headers communicating with the openings in said hollow brick, a brick outer wall surface against said concrete wall, headers at intervals in said outer wall surface extending into said concrete wall, and reinforcing rods encircling said annular series of rods between said headers, substantially as described.

In witness whereof, I have signed this specification in the presence of two subscribing witnesses.

JOHN V. BOLAND.

Witnesses:

R. M. LAWRENCE,
J. D. RIPPEY.