

(No Model.)

W. E. STEVENS.

CHIMNEY FOR DWELLING HOUSES.

No. 311,149.

Patented Jan. 20, 1885.

FIG. 1.

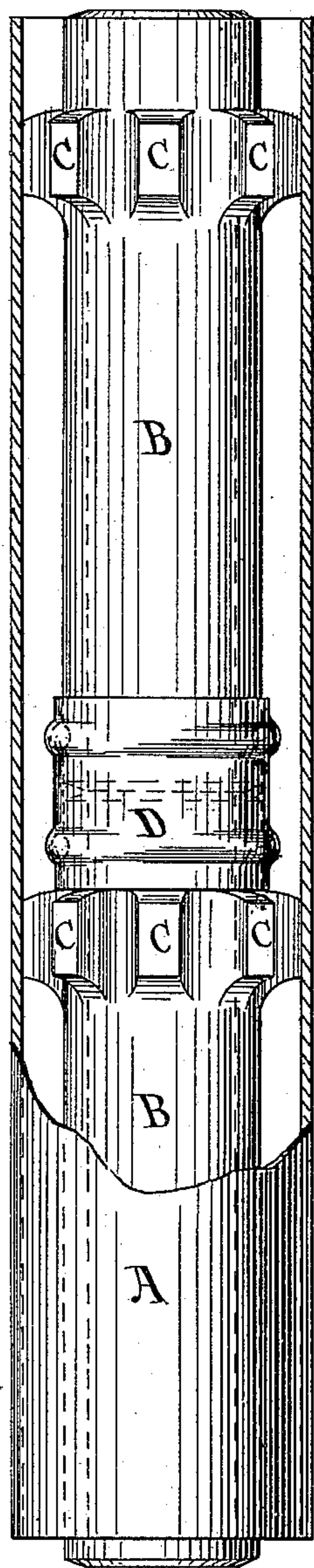


FIG. 2.

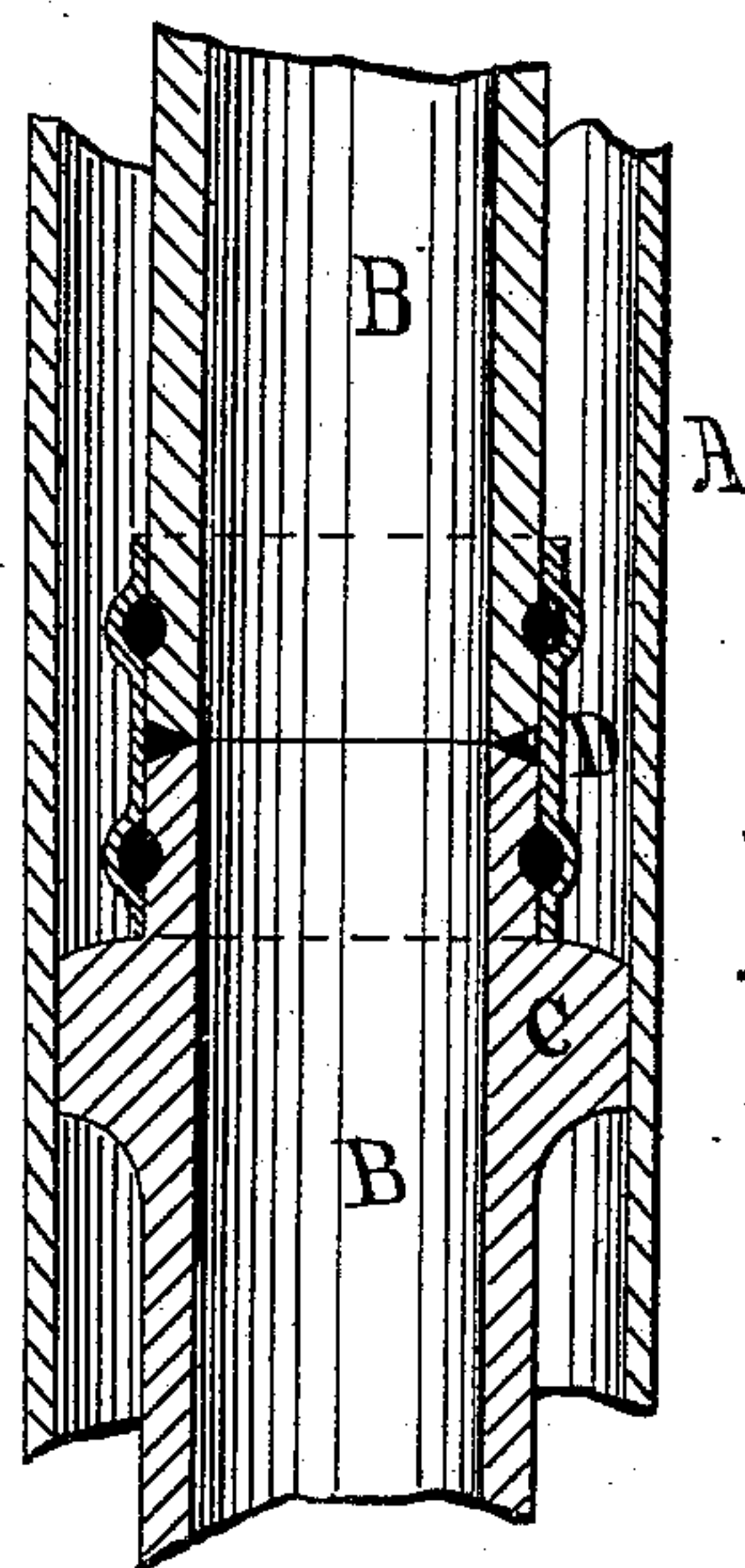
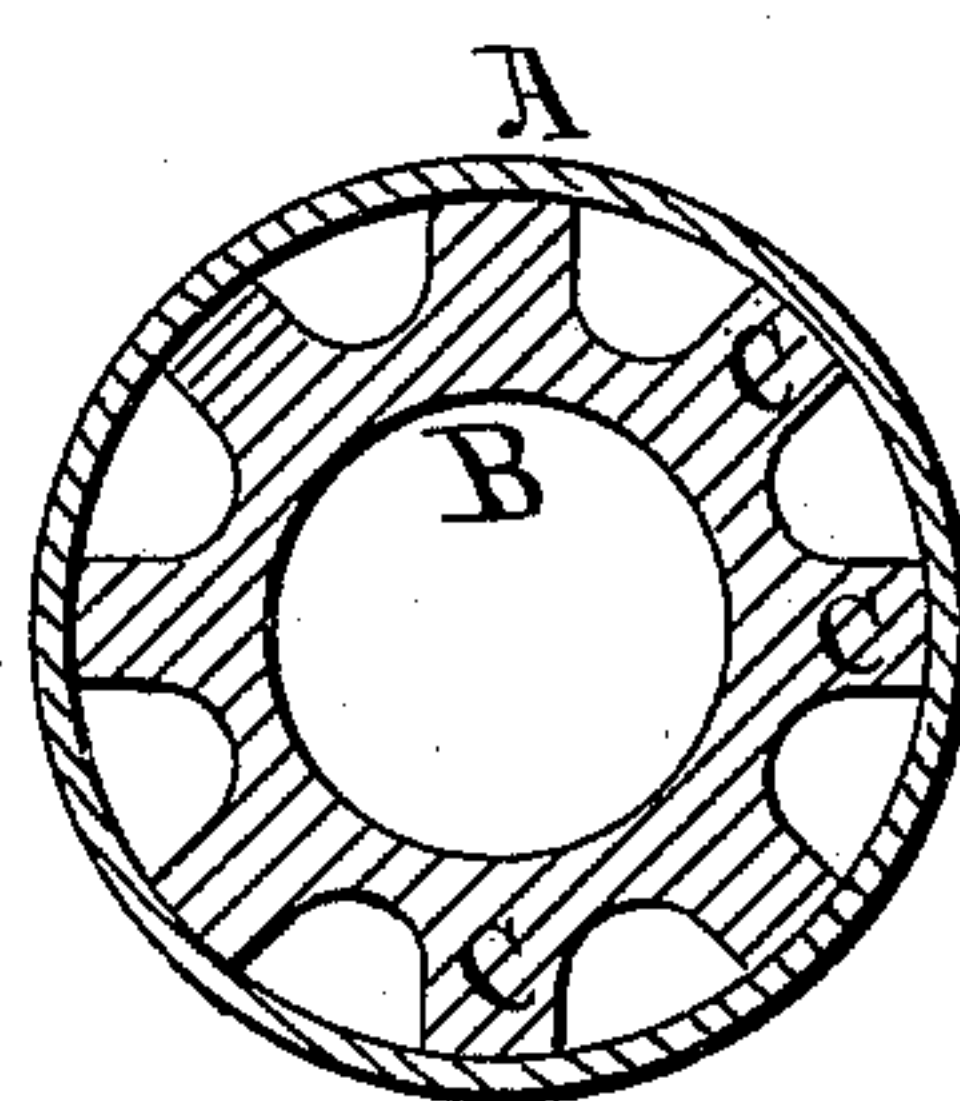


FIG. 3.



WITNESSES

M. A. Wheaton
Clinton M. Wilbur

INVENTOR

William E. Stevens

UNITED STATES PATENT OFFICE.

WILLIAM E. STEVENS, OF SAN FRANCISCO, CALIFORNIA.

CHIMNEY FOR DWELLING-HOUSES.

SPECIFICATION forming part of Letters Patent No. 311,149, dated January 20, 1885.

Application filed March 12, 1884. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM E. STEVENS, of the city and county of San Francisco, in the State of California, have invented certain new and useful Improvements in Chimneys; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

My improvements relate to that class of double chimneys which are usually made with an outside case of metal, and an inside chimney or flue, which is composed of short lengths of tubes or sections, and which sections are commonly made of tile or burnt clay. They are placed in the chimney in line, so as to form a continuous flue, and their abutting ends are held in place by being inserted in some kind of a band, which is usually made of metal. This class of chimneys is often built from forty to one hundred feet in height. The great weight resting upon the lower sections of tile greatly endangers their being crushed or broken whenever they are bent, as they often are at their joints, out of a true line, or whenever the bearing of the weight is not evenly distributed over the abutting ends of the tile-sections. The sections are not nearly as strong as metal, and the strength of the tile-sections, which is never great, is severely strained and tried by the constant changes from cold to great heat and back to cold again, which the alternate building and putting out of fires within the chimneys create. At the same time tile chimneys take up less house-room than do brick chimneys, and, not being liable to destruction, as metallic chimneys are, from the chemical action of the products of combustion, they are very desirable.

While different clay sections can be molded in exact sizes and shapes, it is impossible to burn them into tile without their changing more or less in form or size. In practice, the tile-sections of which the chimneys are made are never mechanically true in shape, nor are they of exactly the same sizes at their ends. As commonly put together, therefore, the ends of the tiles do not fit each other, nor do the bands fit the tiles sufficiently close to make a tight joint. The consequence is that air and

smoke penetrate through the joints, the metallic bands are injured by chemical action, the chimneys are bent at the joints out of an exact straight line, and there is constant danger of the lower sections giving away.

The objects and effects of my invention are to remedy the defects resulting to chimneys from the irregularities in the forms and sizes of the tile-sections, to render the joints at the ends of the tile sections tight, so that fire or vapors cannot penetrate through them, and to so connect those joints with the outside metal case that the whole strength of all the material of all the elements in the chimney is combined to prevent any bending of the chimney at the joints.

My object is to produce a chimney light enough in weight and with sufficient lateral strength to be portable in sections of convenient length for handling, and which possesses the greatest efficiency and safety as a fire-flue. To accomplish all these results in one chimney, I combine fire sectional tile-tubes with metal bands at their joints, and with a metallic outside case in such a manner that the tile-sections alone come in contact with the fire or its vapors, and an annular air-chamber extends the entire length of the chimney between the tile-sections and the outside metal casing, while projections from near the upper end of each of the tile-sections so connect the inner flue with the metal outside case that the strength of both are combined to resist lateral pressure and retain the chimney in whatever line it is first placed. The solid joints, with the annular chamber and the outside case joined and connected as herein described, form a combination in which all the elements co-act to furnish great strength and durability to the chimney, and at the same time render it peculiarly efficient and safe as a fire-flue.

In the drawings similar letters of reference refer to corresponding parts.

Figure 1 of the drawings is a section of my improved chimney with the outside case cut away, showing the outside of the inner chimney or flue made with my improvements. Fig. 2 is a vertical section taken through the center of the chimney, and shows the details of my improved joint and means of holding the sections of the chimney together. Fig. 3 is a

horizontal sectional view of a tile-section, taken through the projections C.

In the drawings, A is the outside metallic case that forms the outside of the chimney. C are projections that are molded upon the tile-sections and constitute a solid part of them. These projections C are molded in such form that their exterior ends will extend just far enough out from the main surface of the tile-sections to fit the inside of the metallic casing A. The casing A will be larger than the tile-sections B, so as to leave an annular chamber between them to permit a circulation of air and also to increase the safety of the chimney by giving it additional strength mechanically, and also an additional safeguard against the communication of fire from the inside of the chimney to the combustible parts of the building nearest to it. The projections C are made with the openings between them for the purpose of making the annular chamber around the sections B practically continuous the whole length of the chimney and affording a vent for the free circulation of the air therein. I make the projections C near the upper end of each section, leaving just enough of the section B above them to reach to the middle of the band D. The band D surrounds the adjoining end portions of each two sections for the purpose of holding them in place. Bands similar to these are in common use for the purpose of holding the tile-sections in line with each other and covering the joint between them; but I have added devices to the usual forms by which I am enabled to make the bands D hold the sections together and prevent them from being drawn apart endwise, and at the same time form a solid and perfect connection of the parts that furnishes a greater security for strength and for the prevention of fire communication than any similar joint ever made. Fig. 2 shows two annular grooves in the band D. One of these grooves is near the upper end of the band, and the other is near its lower end. The joint of the tile-section comes between these annular grooves. The annular grooves run around the inside of the band, and when the band is made of thin metal they cause corresponding bulges to run around the outside of the band, as shown in Fig. 1. Near the end of each tile-section I make a reverse annular groove around its circumference, so that when the ends of two sections are joined together inside the band each one of the annular grooves in the band will be opposite an annular groove around the section, and the two grooves together will form around the tile-section an orifice of which a part will be in the tile-section and the other part will be in the band. These orifices I fill with soft wet cement when putting the ends of the tile-sections in the band. The cement will turn to an artificial stone in a very short time and form a key, filling the orifices, that will prevent the sec-

tions from being pulled apart. The cement being put in while soft and plastic it will adapt itself to the inequalities of the parts, and make a tight joint between them at the same time that it forms a key to prevent the sections from being pulled apart.

In order to still further strengthen the joint I mold one or both of the ends of the tile-section a little beveled, as shown at the ends of the tile-sections in Figs. 1 and 2, so that when the ends of two sections are placed together another annular groove is formed, as shown in Fig. 2. In putting the joints together, I prefer to first attach the band to the lower section and let the cement in the lower annular orifice get hard and solid. This can be done at the factory any length of time before the chimney is to be erected. I then put enough cement around the upper end of the lower section inside the band to entirely fill the vacant space which the beveled end or ends create, so that when the lower end of the upper section is pressed down within the band the cement will be pressed into the shape of all the adjoining parts, and make a solid tight-fitting filling between the adjacent ends of the tile-sections and the band. The entire joint will thus be made with the tile-sections and three cement rings, each of which cement rings is made with the cement while in a soft and plastic condition, so that it fills all irregularities and makes a solid tight connection between the adjacent parts. The cement may be placed in the annular grooves by the hand when the band is about to be placed onto the tile-section, or holes may be made through the band-openings into the annular orifice, and the wet cement introduced through such holes for filling the orifices. Any person skilled in the use of cement or mortar will understand how to do this. The projections C reach from the tile-section to the outside case, A, and prevent the flue tile-sections from bending out of line inside of the case. By this arrangement the strength of the outside case and the inside sectional flue are combined for holding the chimney in line, and the whole combination creates a chimney of great stability, security, and efficiency, which preserves the annular air-chamber, and whose cost is not preceptibly greater than that of the tile-chimneys in common use.

I am aware of the following United States Patents, and claim nothing that is shown in them, viz: Patent No. 268,770, granted to Charles Buck, assignor to G. W. Rader & Co., December 5, 1882; also Patent No. 280,024, granted to William P. Esterbrook, assignor to G. W. Rader & Co., June 26, 1883; also Patent No. 170,473, granted to Harvey K. Flagler and Charles F. Brown, November 30, 1875.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A chimney composed of the outside cas-

ing, A, tile-sections B, with the projections C
near their upper ends, the bands D, and the
annular filled orifices inside of the band D, all
constructed and arranged substantially as
5 herein described.

2. The combination, in a chimney, of the out-
side metallic case, A, and metal band D, with
the tile-sections, having the projections C near

their upper ends, all combined and arranged
substantially as herein set forth.

WM. E. STEVENS.

Witnesses:

M. A. WHEATON,
CLINTON M. WILBUR.