F. D. WHITE.

SECTIONAL CHIMNEY.

APPLICATION FILED APR. 22, 1918.

1,347,980. Patented July 27, 1920.

FIG. 1.

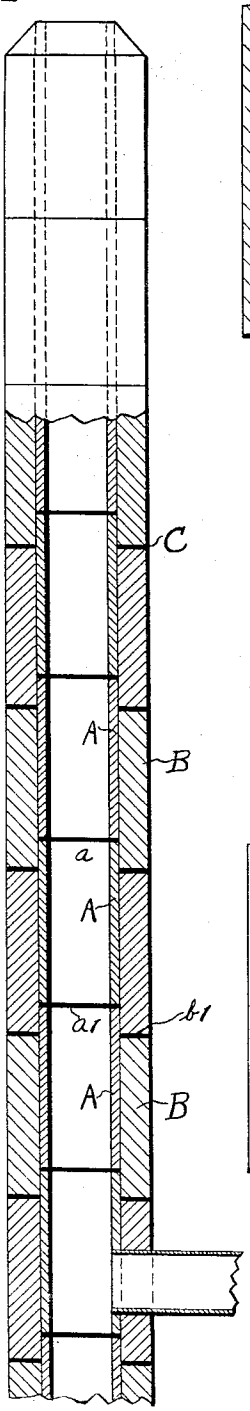


FIG. 2.

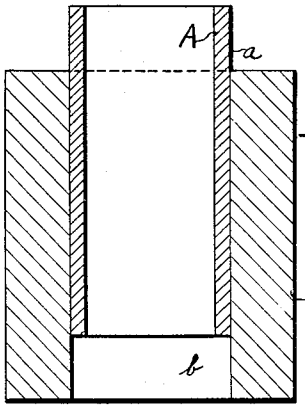


FIG. 3.

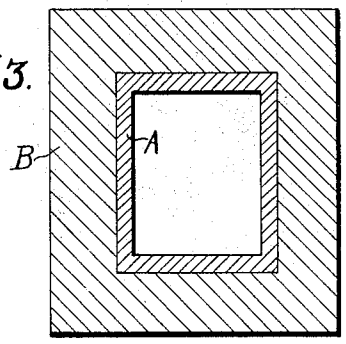
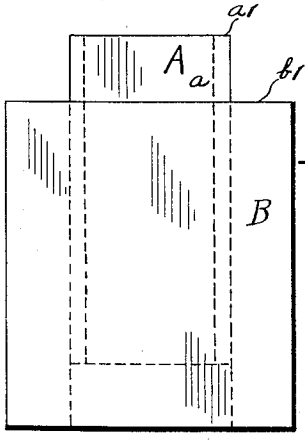


FIG. 4.



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UNITED STATES PATENT OFFICE.

FRANK D. WHITE, OF AKRON, OHIO.

SECTIONAL CHIMNEY.

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Application filed April 22, 1918. Serial No. 229,924.

To all whom it may concern:

Be it known that I, FRANK D. WHITE, a citizen of the United States, residing at Akron, in the county of Summit and State of Ohio, have invented a certain new and useful Improvement in Sectional Chimneys, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

In the construction of chimneys for houses and other buildings the requirements for resisting heat do not correspond with the requirements for structural strength. In other words, the load on a chimney is greatest at the bottom, while the greatest heat is generated some distance above the bottom, and the heat in the chimney, while decreasing toward the top, does not decrease in the same ratio as the load. Moreover, the technical requirements of using standard bricks, the matching with walls, etc., make it desirable to have the chimney of the same horizontal dimensions in one direction throughout, and frequently of the same horizontal dimension in both directions.

The ideal for a chimney is one in which the heat resisting qualities are proportional to the heat developed and the load resisting qualities proportional to the load. One of the objects of this invention is to provide for the construction of a chimney which shall closely approximate this ideal. In accomplishing this I make the chimney of sectional units varying in their composition, whereby I obtain strength where strength is principally required, heat resistance and strength where both are required, and heat resistance and lightness where the resisting of heat is the principal consideration.

By making the chimney sectional further advantage is obtained of cheapness and rapidity of construction. The sections may be kept in stock ready for use, and may be laid up whenever desired without requiring the services of a skilled brick mason.

To attain the results stated I make each section of an inner heat-resisting tubular member and an outer load-resisting tubular member embracing the inner member, and I offset the inner member with reference to the outer member, as by extending its top above the top of the outer member and locating its bottom above the bottom of the outer member. Each section, therefore, interlocks with the adjacent sections above and below, and the chimney may be rapidly built by placing one section on top of the other, mortar being applied at the joints, as desired.

The offsetting of the inner member with reference to the outer section not only simplifies the building of the chimney and insures the sections being laid in proper column, but makes a tighter and more fire proof joint of the inner member, preventing the escape of products of combustion.

In the drawings, Figure 1 is a sectional side elevation of a chimney illustrating my invention; Fig. 2 is a vertical section through one of the chimney sections; Fig. 3 is a horizontal section thereof; Fig. 4 is a side elevation of the chimney section.

The inner member of my chimney, designated A, is preferably rectangular, of proper dimension for a single flue and is made of burned fire clay of sufficient strength to resist lateral strains, which might be transmitted from the adjacent section. The outer member of the chimney, designated B, is of considerably greater thickness and embraces the member A and adheres to it.

The member A is of the same length as the member B but extends above it a suitable distance as indicated at *a* which leaves a space *b* of corresponding height within the lower portion of the outer member. Owing to the offsetting stated the sections may be laid up one above the other as illustrated in Fig. 1 the successive inner members abutting each other and the successive outer members abutting each other. A mortar bed of corresponding thickness is ordinarily placed on the top *b'* of the outer member and on the top *a'* of the inner member, thus producing the mortar joints indicated at C in Fig. 1.

The material of the outer member varies according to the location of the section. In the basement, where the proportion of heat is reduced while the load resistance must be greatest, I prefer to make the outer member of concrete. For location in intermediate portions of the chimney, where there must be load resistance and also a high degree of heat resistance, I prefer to make the outer member of a composition containing asbestos associated with a suitable binder having

considerable strength. I find a very satisfactory composition for the outer member of these intermediate sections is

Asbestos	45%
Gypsum	45%
Silicate of soda	10%

For the sections near the top, where the load-resistance requirements are much reduced, I may make the outer member of gypsum and slag or other waste cinderated material which is light and cheap.

In the manufacture of my chimney, I form the lining member in the usual manner of tile and thoroughly bake it, and after it is completed I cast the outer member about it by pouring it in plastic form into a suitable mold, the outer member being of such composition that it sets and hardens as it dries.

By building chimneys with my sections it is only necessary for the builder to lay the bottom load-resisting section on a suitable foundation, and surmount this by the other sections selected according to the heat and load requirements as above explained. The chimney may be laid up with great rapidity, and by employing ready-made sections there need be no delay in the construction of the rest of the building, as is frequently the case with brick chimneys. Or my sectional chimney may be laid up simply a few sections at a time as the work of building the structure progresses. For several flues, several columns of sections are made side by side.

By employing sections selected according to their heat and load requirements, I reduce the size of the chimney and save material and labor, since, if the chimneys, as ordinarily built of brick, are sufficient to resist the heat at the hottest point there is a waste of material not required for either load-carrying or heat-resisting purposes at some other points. As heretofore constructed, particularly in the best residences, chimneys have usually had a cross section sufficiently large to carry the maximum load and also sufficient for the maximum heat, without much regard to the specific requirements at different elevations. On the other hand, if brick chimneys are built with their material apportioned according to the load they do not have sufficient heat resisting properties in the vicinity of the first floor above the basement, and the reports of fires from defective flues indicate that this is not an infrequent occurrence. Finally, both the heat and load requirements are frequently made subsidiary to the desirable characteristic of a single size in cross section.

It should be further noted that by reason of the off-setting of the inner section of the chimney with reference to the outer section, I am enabled to make the chimney gas tight without having to add extra thickness of wall for that purpose. The gas tight characteristic results in the chimney laid up as shown in Fig. 1, even though the mortar joints may not be absolutely tight; for the inner joint, it will be seen, is higher than the outer joint, and as the hot gas tends to rise leakage at the inner joint would not reach the outer joint.

My chimney is believed to be more accurately heat resistive, to possess sufficient strength without unnecessary weight, and at the same time to be simpler and cheaper and much more readily constructed, than chimneys built in the present manner.

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

1. A sectional chimney made up of individual units of substantially uniform cross section, each comprising a comparatively thin heat resisting lining and a comparatively thick outer load resisting tubular member embracing and joining the lining, the outer members of the units in different portions of the chimney varying in their heat resisting and load resisting properties in accordance with requirements incident to their relative location in the chimney.

2. A chimney composed of surmounting inter-engaging sections, the cross-sectional dimensions of said sections being uniform but their composition variable in different portions of the chimney, whereby sections of requisite heat resisting and load resisting properties may be assembled according to the requirements of different portions of the chimney.

In testimony whereof I hereunto affix my signature.

FRANK D. WHITE.

Witnesses:
D. W. Holloway,
D. H. Holloway.