Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

H. E. SMYTHE.
CHECKER WORK FOR REGENERATIVE FURNACES, HOT BLAST STOVES, AND THE LIKE.
APPLICATION FILED MAR. 23, 1916.

1,242,614.
Patented Oct. 9, 1917.

INVENTOR.
H. E. SMYTHE
by F. N. Barber
ATTORNEY.
HORACE E. SMYTHE, OF PITTSBURGH, PENNSYLVANIA, ASSIGNOR TO THE S. R. SMYTHE COMPANY, OF PITTSBURGH, PENNSYLVANIA, A CORPORATION OF WEST VIRGINIA.

CHECKER-WORK FOR REGENERATIVE FURNACES, HOT-BLAST STOVES, AND THE LIKE.


Application filed March 23, 1916. Serial No. 86,188.

To all whom it may concern:

Be it known that I, HORACE E. SMYTHE, a citizen of the United States, residing at Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented new and useful Improvements in Checker-Works for Regenerative Furnaces, Hot-Blast Stoves, and the like, of which the following is a specification.

My invention relates to checker-work for regenerative furnaces, hot-blast stoves, and the like.

It is the object of my invention to provide a checker-work composed of cylindrical checkers, or bricks, built up in courses, the checkers, or bricks, in each course being arranged at right angles to those in the next course above and below. Alternate courses have the checkers, or bricks, lying in the same direction, or in parallel relation. It is another object to construct a checker-work from single design of checker or brick, presenting no surfaces on which flue dust, slag, carbon, coal dust, etc., can accumulate and which will not present large friction or obstruction to the passage of the waste gases, air, and fuel gas. Another object is to provide a checker or brick, simple in construction and cheap to make, and constructed to form in assembly a firm structure easily cleaned and repaired.

Referring to the accompanying drawings, Figure 1 is a side elevation of a portion of a checker-work constructed from my improved checkers and disposed so as to form uninterrupted passages; Fig. 2, a plan view of a checker-work like that shown on Fig. 1; Fig. 3, a side elevation showing a different arrangement of the said checkers disposed so as to form staggered passages; Fig. 4, a plan view of a checker-work like that shown on Fig. 3; and Fig. 5, a section on the line V—V, Fig. 3.

In the construction of checker-work in accordance with the principles of this invention, I use a single form of checker, or brick, which I may arrange in one manner so as to provide unobstructed vertical passages or flues, for the waste gases, air, or fuel gas, or in another manner so as to provide interrupted or staggered passages or flues. Each checker, or brick, is a solid composed of suitable refractory material, such, for example, as that of which fire brick is made.

With the exception of the ends and a central notch, the checkers are preferably cylinders. I prefer that the cross-sections of the checkers be circles because they can be easily made, they receive uniform treatment throughout in the kiln in which they are burned, and they have a surface which catches but little dust and impedes the passages of the gases very little. Cylindrical checkers have the same strength along all diameters and need not be placed in the checker-work so as to have any particular side up in order to secure maximum strength. They pack economically for shipment and use a minimum of material for a given degree of strength.

For checker-work with open, or uninterrupted vertical passages, or flues, such as are shown at 1, 2, and 3, Fig. 2, I construct the checkers 4 with their ends reduced so as to form the necks 5. Preferably these necks taper on small arcs toward the ends of the checkers. To describe the ends of the checkers in another way, they have annular or circumferential grooves, the base of each groove being curved so as to coincide with small arcs lying in planes which include the longitudinal centers, or axes, of the checkers. Preferably, the said arcs are parts of circles having the same radius as the circles at the very ends of the checkers.

Preferably each checker has a shallow transverse notch 6 midway between its ends. Each lateral half of the notch is shaped so as to fit the neck of a checker arranged transversely of the checker having the notch.

Referring now to Figs. 1 and 2, the bottom course of checkers is arranged in parallel rows, each row being composed of checkers arranged in a straight line with their ends registering, or close together, the necks 5 of each two consecutive checkers in each row forming an annular groove to receive the necks of the checkers in the second course, which last named checkers are arranged at right angles to the checkers in the first course. The necks of the checkers in the rows constituting the second course meet over the longitudinal, or axial, centers of the checkers in the bottom course. The rows of the third course of checkers lie directly over the rows of the first course, the necks of the checkers in the third course being supported by the registering necks of
the checkers in the second course. In the manner described the checkers will be assembled in the required number of courses to build the checker-work up to the prede-
termined height. The rows of checkers in each course lie at right angles with the checkers in the course next above and below it, and the checkers in each row have each of their necks supported on the necks of two consecutive checkers in the course below it, the ends of each two consecutive checkers meeting over the ends of two consecutive checkers below.

The notches 6 have no function in the form of checker-work just described, but I prefer to provide all the checkers with the notches 6 as only one kind of dies is required to make them whether checker-work is built with the alternate rows of checkers staggered or in perfect vertical arrangement.

Referring now to Figs. 3, 4, and 5, the bottom course of checkers is arranged in parallel rows, as in Figs. 1 and 2, with the consecutive checkers in each row having their necks registering. The second course of checkers is composed of parallel rows of checkers having their necks resting in the notches 6 instead of in the grooves or notches formed by the registering necks 5. Other courses are made in the same manner, the necks of the checkers in one course being supported by the notches 6 in the checkers in the course below. By arranging the checkers in the manner just described, the rows of checkers in alternate courses are staggered, that is, the rows of checkers in each course lie in vertical planes midway between the vertical planes which include the checkers in the second course above and below.

I can build either type of checker-work shown and described by using a single design of checker, or I can build a checker-work with a portion composed of one type and another portion composed of the other type. The checkers are prevented from lateral movement in the checker-work by reason of their necks being seated in recesses or notches in the middle of the checkers or at their ends. By reason of the cylindrical shape of the checkers very little dust, soot, and other matter will be caught thereon, and there will be but little obstruction to the passage of waste gases, and fuel gas.

I claim—

A checkerwork for regenerative furnaces, hot-blast stoves and the like, comprising horizontal courses of bricks, each brick having end depressed portions and a central transverse depressed portion, the bricks in each course being arranged in parallel lines and each line being composed of bricks arranged end to end and each course being arranged at right angles to the next course below it with the abutting ends of the bricks in one course seated in and resting upon the depressed portions of the bricks in the next course.

Signed at Pittsburgh, Pa., this 20th day of March, 1916.

HORACE E. SMYTHE.