Jan. 17, 1950 F. E. KLING 2,494,816

HOT BLAST STOVE

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FIG. 1.

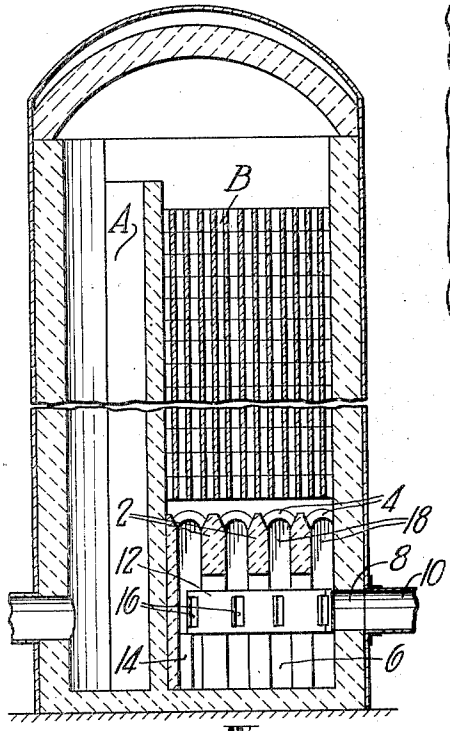
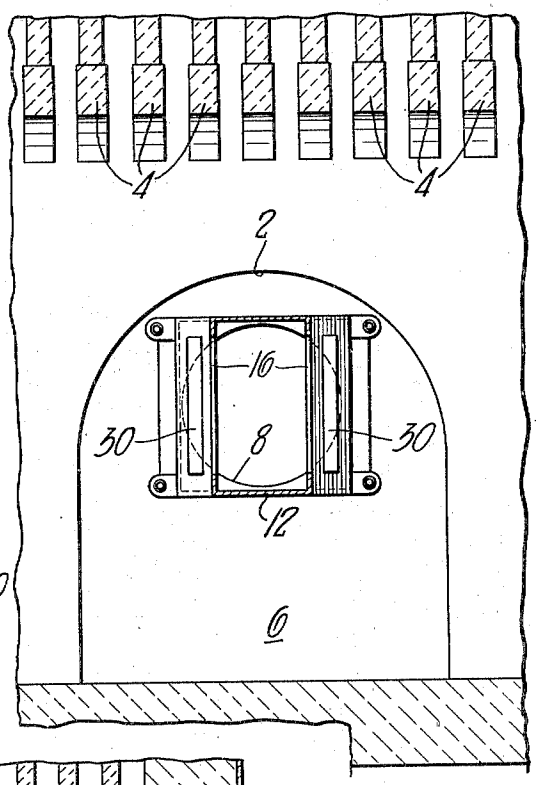


FIG. 4.



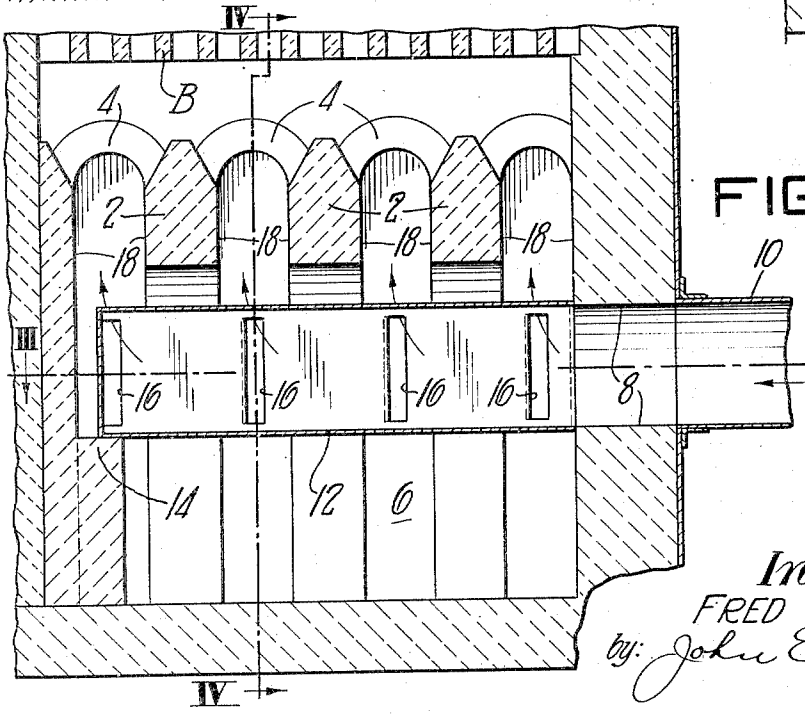


FIG. 2.

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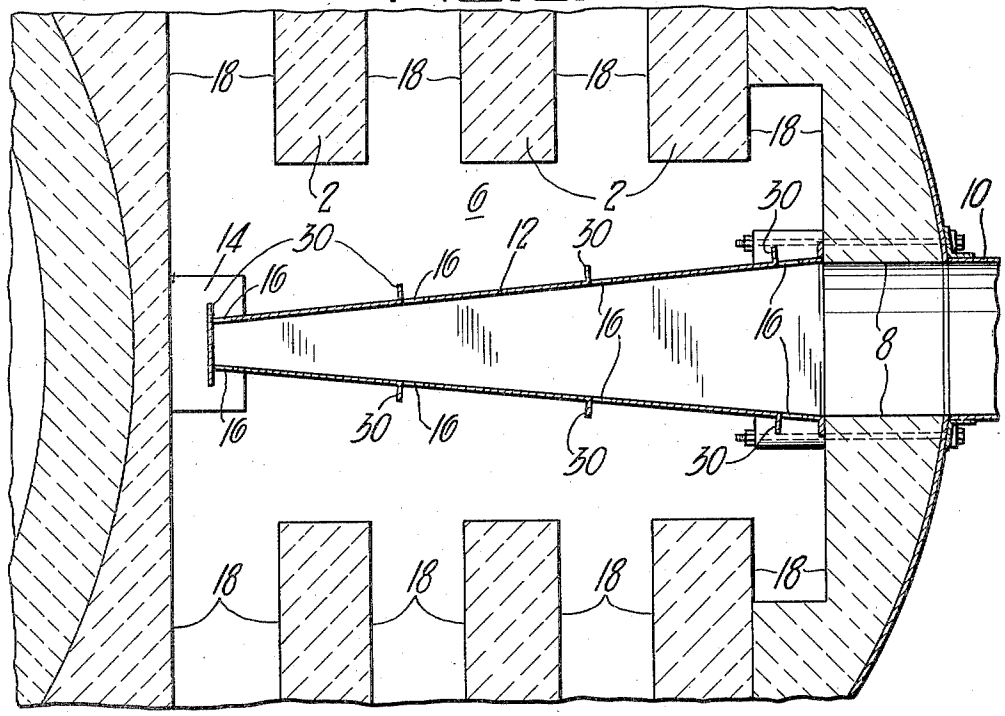
FIG. 3.



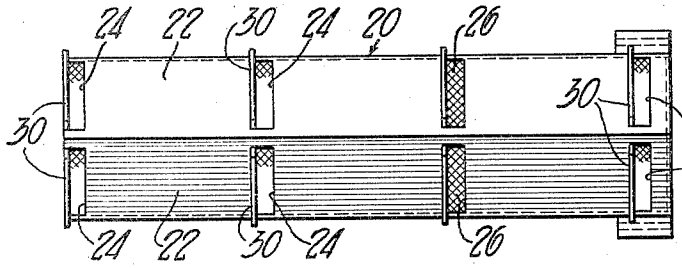


FIG. 5.

FIG. 6.

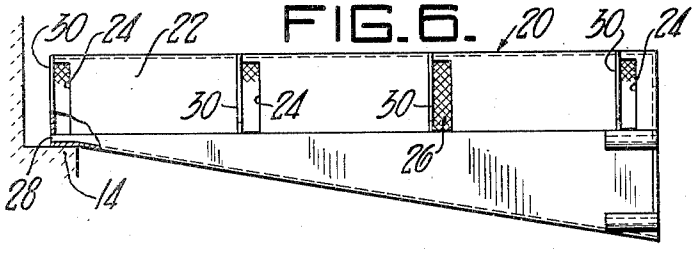


FIG. 7.

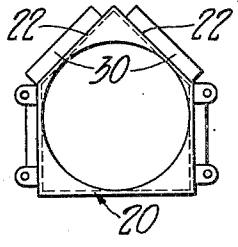
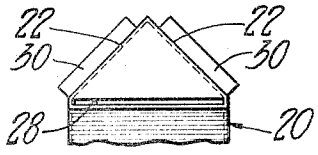


FIG. 8.



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UNITED STATES PATENT OFFICE

2,494,816

HOT-BLAST STOVE

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Application May 18, 1945, Serial No. 594,519

3 Claims. (Cl. 263—19)

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This invention relates to improvements in hot blast stoves and more particularly to improved means for injecting the cold blast therein.

The supporting structure for hot blast stove checkerwork has been a source of considerable trouble in recent years due to increased size of checkerwork and high operating temperatures. Steel supports have frequently failed due to high temperatures. While this may be corrected by using steel blooms and thick slabs, this undesirably increases the total weight of the stoves. Brick supports are generally preferable for the high temperature conditions involved, but these too have collapsed, putting the stoves out of operation while the checkerwork was still in fair condition. I have discovered that such failures are largely due to abrading or eroding of the brick supports by the cold air blast picking up and swirling dust and spalled off pieces of checker-brick against the supporting pillars and arches.

It is accordingly an object of the present invention to provide an improved means for injecting the cold blast into hot blast stoves.

It is a further object to permit the use of brick supports for the checkerwork in hot blast stoves.

It is another object to obviate the collapsing of checkerwork in hot blast stoves due to failure of the supporting structure.

The foregoing and further objects will be apparent from the specification and drawings, wherein:

Figure 1 is a vertical section;

Figure 2 is an enlarged detail of Figure 1 showing the manifold of my invention;

Figure 3 is a section on line III—III of Figure 2;

Figure 4 is a section on line IV—IV of Figure 2;

Figure 5 is a plan of a modified form of manifold;

Figure 6 is a side view thereof;

Figure 7 is an elevation of the outer end; and

Figure 8 is an elevation of the inner end.

Referring more particularly to the drawings, there is shown in Figure 1 a hot blast stove composed of a combustion chamber A and checker chamber B. The checkerwork in checker chamber B is preferably supported on main arches 2 and cross arches 4, formed of brick. Below the arches 2, forming a chamber 6, there is provided in the stove wall an inlet 8 connected to the cold blast main 10. Interiorly of the stove in the chamber 6, there is disposed a manifold 12 connected to the cold blast inlet 8 and mounted at its inner end on a suitable support 14. The manifold 12 is generally rectangular in vertical cross section but tapers on its sides towards the inner end to

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provide an even distribution of air through ports 16 oppositely disposed on either side throughout the length thereof. The ports 16 are disposed opposite the open spaces 18 between the arches 2.

In Figures 5 through 8 there is shown a modified form of a manifold 20 wherein the air is projected therefrom upwardly at an angle of 45° or thereabouts instead of laterally. In this form, the manifold has sloping top or roof sections 22 in which are disposed ports 24 at desired intervals to coincide with the spaces 18 between the arches 2. Wire mesh screens 26 are placed over the ports 24 to prevent spalled off pieces of checker-brick from entering the manifold. A small slot 28 may be provided at the inner end to permit any small pieces of brick to be blown out of the manifold.

In this form, the manifold is tapered upwardly from the bottom, so that the inner end has the same width but less depth than the entry end. As in the first described form, the taper is regulated to provide an equal distribution of air from the ports from entry to inner end thereof.

In both forms of manifolds, flanges 30 are provided rearwardly of the ports 16 and 24 to direct the cold blast directly into the spaces 18.

From the foregoing it is seen that the cold blast is directed into the checkerwork in a manner that does not cause turbulence in the chamber 6 and thereby prevents dust and brick particles from being picked up and projected against the supporting structure. As before stated this permits the use of brick supports.

While I have shown and described two specific embodiments of my invention, it will be understood that these embodiments are merely for the purpose of illustration and description and that various other forms may be devised within the scope of my invention, as defined in the appended claims.

I claim:

1. In a hot blast stove including checkerwork and spaced supporting arches therefor, said supporting arches forming a chamber below said checkerwork, a cold blast main connected to said chamber, an elongated box-like manifold of decreasing cross section extending across the center portion of said chamber between said arches connected to said cold blast main, spaced ports in said manifold on the outer sides thereof, baffles on said manifold rearwardly of said ports, said ports being disposed between said arches and said ports and said baffles being proportioned to direct the cold blast outwardly at substantially right angles from said manifold transversely of said chamber between said arches whereby eroding of

said arches by said cold blast is substantially prevented.

2. In a hot blast stove including checkerwork and spaced supporting arches therefor, said supporting arches forming a chamber below said checkerwork, a cold blast main connected to said chamber, an elongated box-like manifold extending across the center portion of said chamber between said arches, said manifold being connected to said cold blast main, spaced ports in said manifold on the outer sides thereof, said ports being disposed between said arches to direct the air blast transversely of said chamber between said arches whereby eroding of said arches by said cold blast is substantially eliminated.

3. In a hot blast stove including checkerwork and spaced supporting arches therefor, said supporting arches forming a chamber below said checkerwork, a cold blast main connected to said chamber, an elongated box-like manifold of decreasing cross-sectional area extending across the center portion of said chamber between said

arches, said manifold being connected to said cold blast main, spaced ports in said manifold on the outer sides thereof, said ports being disposed between said arches to direct the air blast transversely of said chamber between said arches whereby eroding of said arches by said cold blast is substantially eliminated.

FRED E. KLING.

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