

(No Model.)

2 Sheets—Sheet 1.

E. W. TUCKER.
HOT AIR BRIDGE WALL.

No. 455,135.

Patented June 30, 1891.

Fig. 1.

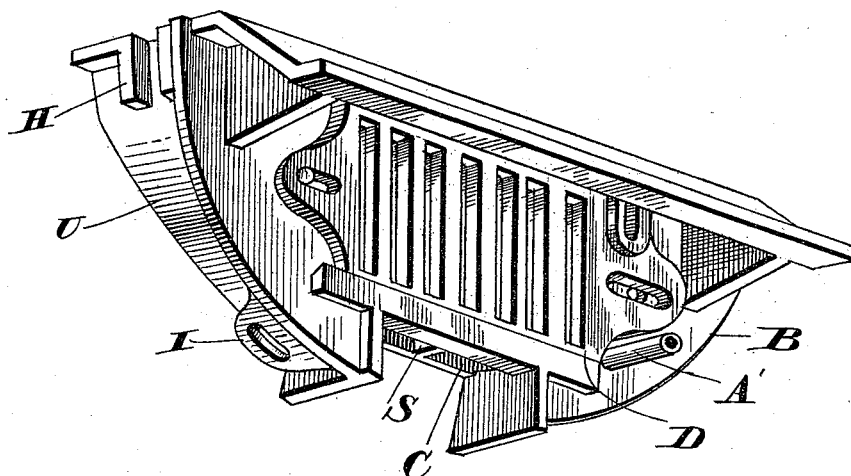
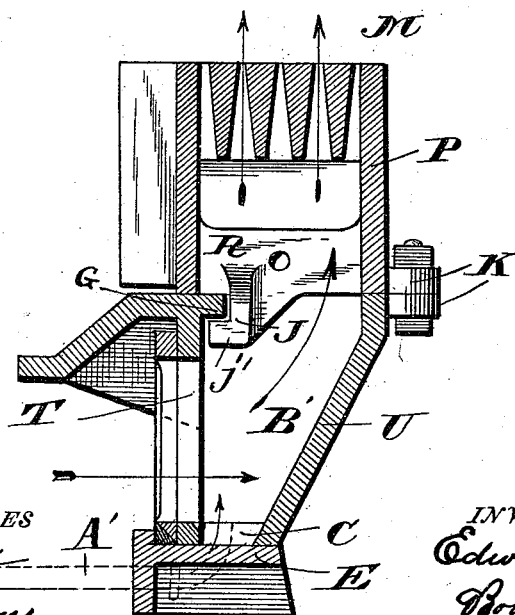


Fig. 2.



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Fig. 3.

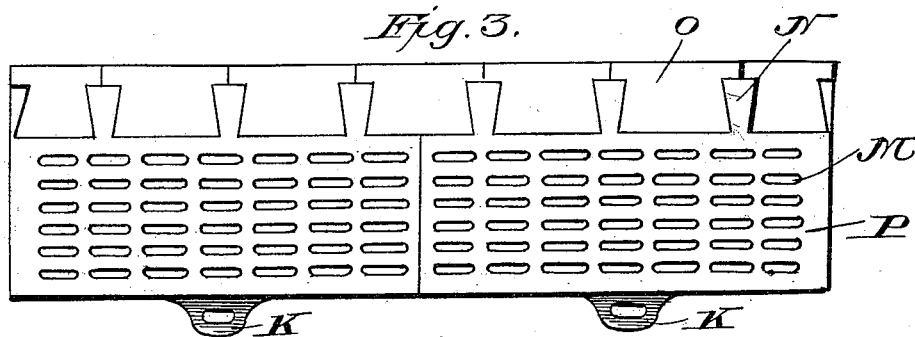


Fig. 4.

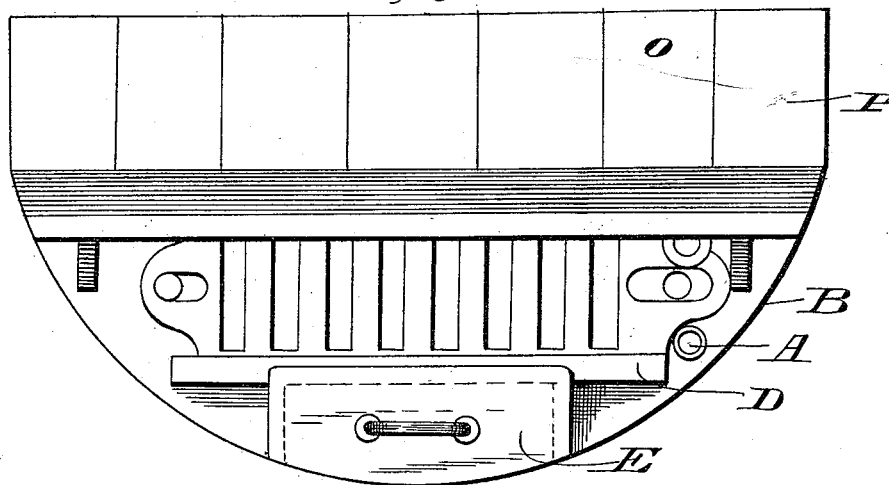
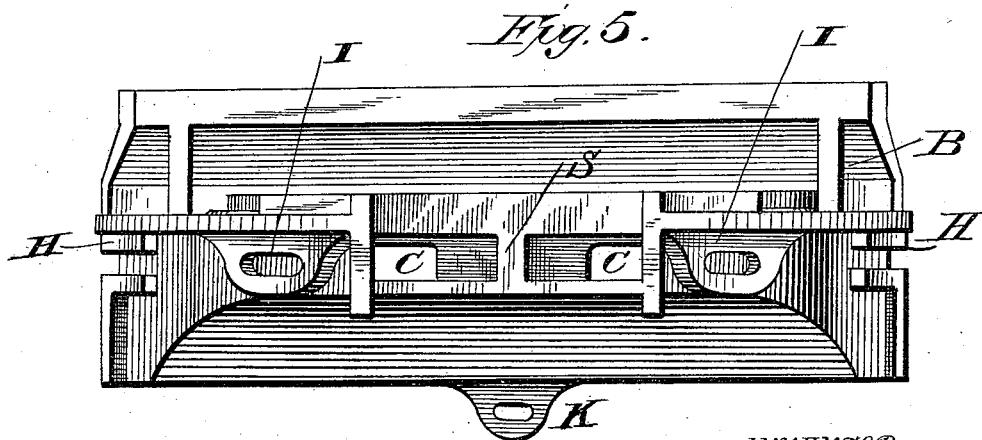


Fig. 5.



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UNITED STATES PATENT OFFICE.

EDWIN W. TUCKER, OF SAN FRANCISCO, CALIFORNIA.

HOT-AIR BRIDGE-WALL.

SPECIFICATION forming part of Letters Patent No. 455,135, dated June 30, 1891.

Application filed October 22, 1890. Serial No. 368,995. (No model.)

To all whom it may concern:

Be it known that I, EDWIN W. TUCKER, a citizen of the United States, residing at the city and in the county of San Francisco, and State of California, have invented certain new and useful Improvements in Hot-Air Bridge-Walls; and I do hereby declare the following to be a full, clear, and exact description of said invention, such as will enable others skilled in the art to which it most nearly appertains to make, use, and practice the same.

My invention has relation to certain new and useful improvements in hot-air bridge-walls for furnaces, which consist of the arrangement of parts and details of construction, as will be hereinafter more fully set forth in the drawings, described, and pointed out in the specification.

My invention relates more particularly to certain improvements upon the Letters Patent granted to me on the 26th day of July, 1887, which consist of a hollow bridge-wall for admission of air into the combustion-chamber.

The invention relates more particularly in providing a hollow bridge-wall which may be so regulated as to utilize either a forced or natural draft of air in order to meet the requirements of the furnace, of such construction as is necessary to its complete and perfect adjustment and adaptation to boiler-furnaces, so that the required strength and durability may be produced conjointly with economy in making repairs, thereby permitting of ready handling.

My invention further consists in constructing a bridge-wall which shall be simpler in its construction, less expensive, and more effectual in its operation than any device of a similar nature heretofore known to me.

My invention consists, furthermore, in providing for the removal of the dirt and accumulated substances upon the interior of the wall, so that at any time when it is found that the effectiveness of the operation of the device is impaired all dirt or sediment may be removed with but the slightest difficulty.

The invention consists, furthermore, in providing a construction whereby the liability of the lower section bulging or breaking out by reason of the intense heat is to a great

extent obviated by the employment of a strengthening-rib S.

The invention consists, furthermore, in constructing the upper casting of several separate sections, whereby the same may be readily handled and the difficulty which has hitherto existed in this respect overcome.

The above constitute the salient points whereby my present invention differs from that set forth in my former Letters Patent hereinbefore mentioned.

Referring to the drawings forming a part of this application, wherein similar letters of reference are used to denote corresponding parts throughout the specification and several views, Figure 1 is a perspective view of the lower casting. Fig. 2 is a transverse section of the entire wall. Fig. 3 is a plan view of the upper casting. Fig. 4 is a front view of the entire device, and Fig. 5 is an inverted plan of the lower casting.

The letter B is used to indicate the bottom or base casting, which is provided with the inclined rear and side walls U. To said casting I secure the front plate T, which, if so desired, may be cast integral therewith. To the front plate I secure or attach the damper D, which is controlled or regulated by means of the rotating rod which was fully described in my Letters Patent hereinbefore referred to. The damper D is used merely to control the inflow of the natural draft to the bridge-wall. The bridge-wall consists of the upper and lower sections or castings, the upper one of which is represented by the letter P. The top of said casting is provided with a series of diverging apertures M in order to create a more perfect supply or draft of the air to the furnace or combustion-chamber, (not shown,) and has bolted to the sides thereof the dovetail strips or lugs N, which permits of the bricks O being secured therebetween in order to fully protect the face thereof from damage.

It will be seen from the drawings that the upper casting is made in several sections. By this construction I am enabled to readily secure the casting in place and as expeditiously remove the same from the lower casting when found necessary for the purposes of repairs or otherwise.

Heretofore, owing to the fact that the up-

per casting has been constructed in one piece, great difficulty has been experienced in removing and replacing the same, owing to its great weight. The lower or base section B is of such height as to fall below the plane of grate-bars, which rest thereon. Each of said sections is provided with the rearwardly-extending projections K, which are adapted to rest on each other and be secured together by means of bolts. The sections are further secured together by means of the lugs J, which fit beneath the inwardly-extending lug G of base B. The lugs J are located inside of section P, and may either be cast or bolted to ribs R. They are of the peculiar shape shown in the drawings, and differ in their mode of attachment from the lugs described in my former patent in being cast with or bolted to the ribs R, which latter are provided with a bolt-hole and are cast integral with the casting. This I consider a great improvement, inasmuch as in practice I have found that feet *j'* of the lugs, which fit beneath the inwardly-extending lug G, are quite liable to be broken or damaged. When this occurs the rib R remains intact, and I then merely attach another lug J to it by running a bolt through the hole of its rib and through the hole of the remaining rib R. I am thus enabled to readily substitute a new lug whenever an old one is broken without dismantling the machine.

The bridge-wall is secured within the furnace by means of the lugs H, which have an opening or slot formed therethrough extending to the top of the base casting and slip over fixed studs in order to prevent its being forced backward, and by means of the lugs I, which slip over suitable studs, the nuts of which serve to draw it down and hold the same firmly in position. This will be found quite a convenient arrangement in determining the proper position at which the fixed studs should be affixed to the furnace-wall, inasmuch as after the bottom section has been placed within the furnace a pencil or other marking device may be run in the slots with the points against the furnace-wall and the proper position of the fixed studs thus readily determined. The bottom of said section is provided with opening C, which permits the escape of dirt therethrough, and also with air-inlet opening A, into which air-inlet pipe A' fits, which is adapted to allow for the inflow of air under pressure in order to create a forced draft.

While I have described the air entering under pressure through the bottom of the base-section, it is obvious that the same may be admitted at any point deemed most advisable for the admission of the forced draft. The forced air enters into chamber B' of section B and has its exit through the diverging openings formed in the top of section P. However, in order to obviate the liability of the inflowing air escaping through the bottom openings, I provide the ordinary Tompkin

plate E. I thus obtain a more perfect commingling with and combustion of the gases, create a thorough consumption of the coal, give greater heat, and cause a saving in the burning of coal.

The bottom opening in connection with my device I consider of great importance, inasmuch as by simply removing the plate E all sediment or dirt may be removed, while when said plate is in proper position the air which enters either by the forced draft or by the natural draft-channels is prevented from escaping.

By forming the bridge-walls in section, united as set forth, I am more readily enabled to take the same apart in case of breakage or damage ensuing thereto.

It will be readily observed that the several features or parts may be readily cast or formed integral, if so desired.

In practice it will be found that the lower casting is materially weakened by the bottom opening and the front damper-controlled openings, and consequently there is a danger of said section breaking or bulging out by reason of the intense heat. To guard against this I provide the interior strengthening-rib S, running from the top of the lower casting to the bottom thereof.

Having thus described my invention, what I claim as new, and desire to secure protection in by Letters Patent of the United States, is—

1. In a hot-air bridge-wall for furnaces, the combination of a lower casting provided with a series of rearwardly-extending lugs, an upper casting consisting of several sections, each provided with rearwardly-extending lugs registering with the lugs of the lower casting, and bolts passing through the registering lugs of the two castings, substantially as set forth.

2. In a hot-air bridge-wall for furnaces, the combination of the upper and lower casting, the front wall or plate of the lower casting being provided with suitable draft-openings, a damper for regulating said openings, and an air-inlet for creating a forced draft, said inlet entering the lower casting, substantially as set forth.

3. In a hot-air bridge-wall for furnaces, a casting provided with an opening in its bottom for the escape of sediment, damper-controlled openings in its front plate, and also formed or provided with a central strengthening strip or rib running from the top to the bottom thereof, substantially as set forth.

4. In a hollow hot-air bridge-wall for furnaces, the combination of the upper and lower castings, the latter having an opening in its bottom for the escape of sediment, and also damper-controlled openings in its front plate, a sliding plate for closing said dirt-opening, and a forced-air pipe leading into the lower casting, substantially as set forth.

5. In a hollow hot-air bridge-wall for furnaces, the combination of the upper and lower sections, the lug J within the upper section

and the inward projection G, said lug adapted to engage with the projection G in order to unite said sections, substantially as set forth and described.

5 6. In a hollow hot-air bridge-wall for furnaces, consisting of a base casting and a top casting P, provided with diverging apertures in its top, said top being constructed in two or more sections, ribs R, cast or bolted to said
10 section or top, lugs J, secured thereto, and the inward projection G, substantially as set forth and described.

7. A hollow hot-air bridge-wall for furnaces, consisting of an upper and lower casting suitably secured together, forced-air inlet leading
15 into said casting for the purpose of permitting of a forced-air draft, and the lugs H I

for securing the bridge-wall within the furnace, substantially as set forth and described.

8. In a hollow hot-air bridge-wall, consisting of an upper and lower section, the combination, with the upper section thereof, of the dovetail strips secured thereto and the bricks secured therebetween, said bricks being adapted to protect the section-walls, substantially as and for the purpose set forth and
25 described.

In testimony whereof I affix my signature in presence of two witnesses.

EDWIN W. TUCKER.

Witnesses:

N. A. ACKER,

J. W. KEYS.