(No Model.)

V. O. STROBEL.

CLEANING APPARATUS FOR HOT BLAST OVENS.

No. 350,569. Patented Oct. 12, 1886.

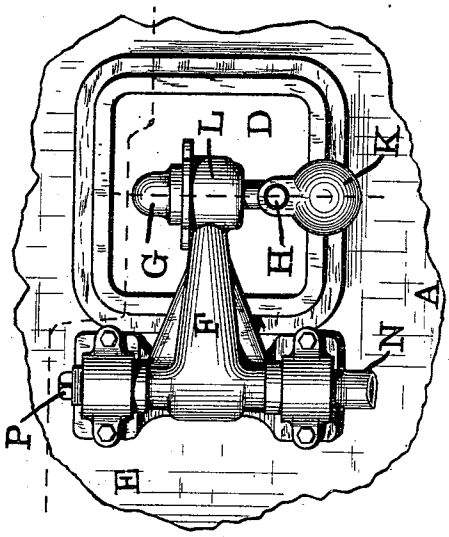


Fig. 2.

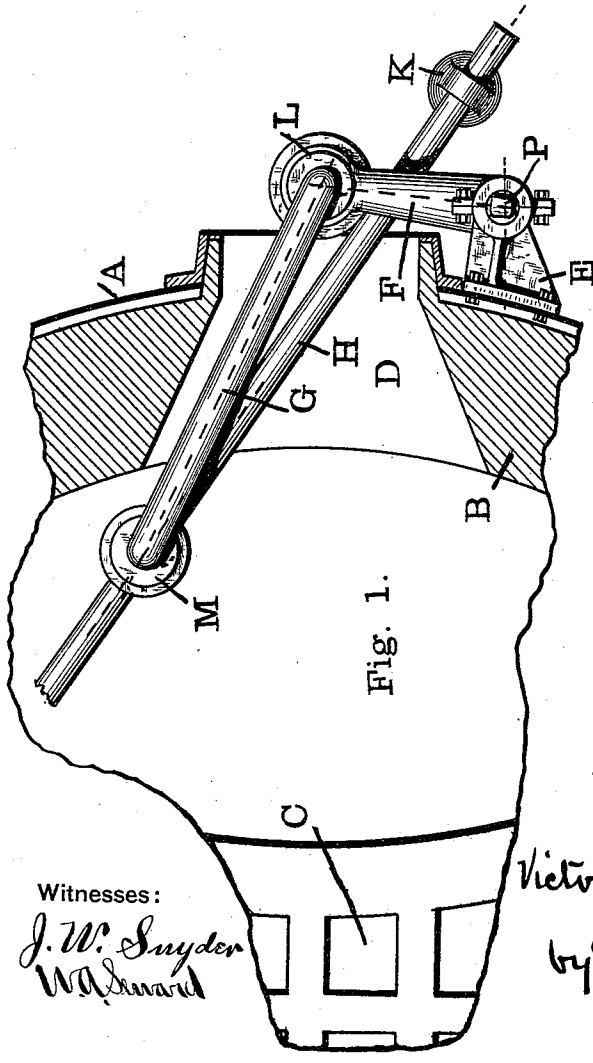


Fig. 1.

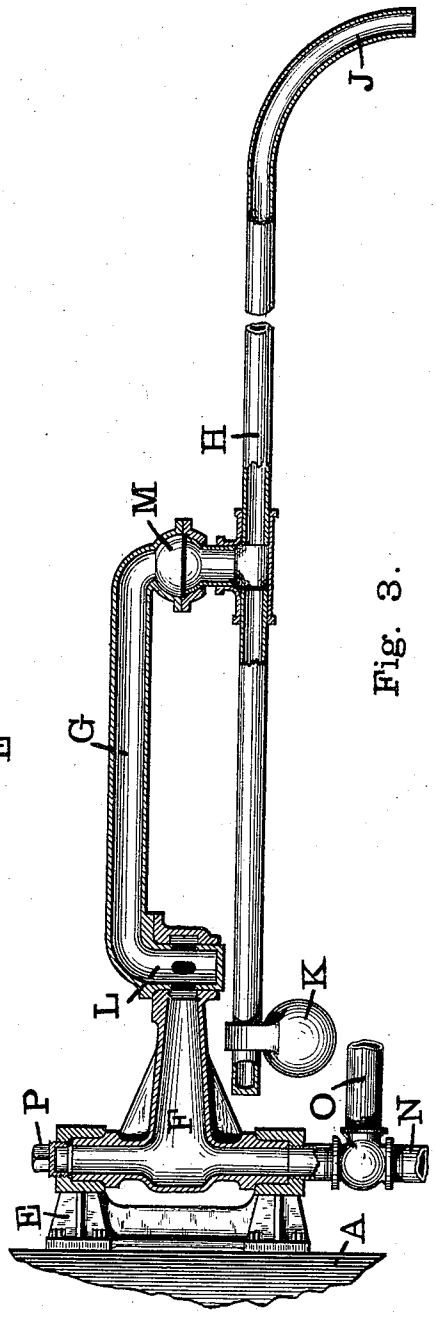


Fig. 3.

Witnesses:
J. W. Snyder
W. A. Seward

Victor O. Strobel Inventor
by James W. See.
Attorney

N. PETERS. Photo-Lithographer. Washington. D. C.

UNITED STATES PATENT OFFICE.

VICTOR O. STROBEL, OF PHILADELPHIA, PENNSYLVANIA.

CLEANING APPARATUS FOR HOT-BLAST OVENS.

SPECIFICATION forming part of Letters Patent No. 350,569, dated October 12, 1886.

Application filed April 30, 1886. Serial No. 200,746. (No model.)

To all whom it may concern:

Be it known that I, VICTOR O. STROBEL, of Philadelphia, Philadelphia county, Pennsylvania, have invented certain new and useful Improvements in Cleaning Apparatus for Hot-Blast Stoves, of which the following is a specification setting forth a description thereof and the manner of using it, and an explanation of the principle thereof, and the best mode in which I contemplate applying that principle.

This invention pertains to apparatus for removing the deposits from the walls and flues of fire-brick hot-blast stoves or regenerators, and the improvements will be readily understood from the following description, taken in connection with the accompanying drawings, in which—

Figure 1 is a horizontal section of part of a hot-blast stove exhibiting, in plan, a cleaning device illustrating my invention; Fig. 2, an elevation of the wall of the stove at the cleaning-opening, with the cleaning apparatus in place; and Fig. 3, a side elevation and part vertical section of the apparatus with the portion of the stove-wall to which it is attached.

In the drawings, A indicates the usual outer metallic shell of an ordinary vertical cylindrical fire-brick hot-blast stove; B, a portion of the shell-wall of the same; C, the usual vertical flues in the stove, in which flues the deposits take place as the stove is used; D, a cleaning door or opening in the side wall of the stove, disposed in the usual manner at a point above the level of the top of the flues; E, a support or bracket secured to the outer surface of the stove, contiguous to the cleaning-door; F, a crane-arm fitted to oscillate in the bracket and of hollow construction, to form a conduit; G, a hollow limb swiveled to the extremity of the crane-arm and supported thereby, the hollow of the limb communicating, through the swiveled joint, with the hollow crane-arm, whereby the limb forms an articulated extension of the crane-arm; H, a cleaning-pipe swiveled to the outer extremity of the limb by a joint of articulation of, preferably, the globe type, so as to permit free articulation of the pipe in all directions with reference to the limb; J, the downwardly-turned outlet extremity of the cleaning-pipe; K, a counterbalance-weight upon that portion of the cleaning-pipe opposite the outlet end; L, the swiveled joint by which the limb connects with the crane-arm; M, the globe-joint by which the cleaning-pipe connects with the limb; N, a pipe leading to the crane-arm through one of the bracket-bearings thereof, this pipe serving to permit the flow of steam to the cleaning apparatus from any suitable source of supply; O, a pipe serving to permit the flow of compressed air to the apparatus; P, a screw-plug, arranged axially in the bracket-bearing opposite the one to which the pipe N is connected.

The pipe N is to communicate with a source of steam-supply under considerable pressure and the pipe O with a source of air-supply under a less pressure, both pipes to be provided with stop-valves. It is obvious that when the valves are open the steam and air will be at liberty to flow through the crane-arm, through the limb, and through and out of the cleaning-pipe, regardless of what position the cleaning-pipe may be adjusted into. The cleaning-pipe is to be made of such a length from its point of connection with the end of the limb to its outlet end as will enable the end of the outlet cleaning-pipe to reach over any of the flues when the outlet end of the pipe is adjusted within the stove through the cleaning-pipe. The opposite end of the cleaning-pipe serves as a handle, by which the workman may manipulate the pipe and direct its inner end, the workman standing, preferably, upon a suitable platform properly erected at the cleaning-opening. The counterbalance-weight should be so proportioned and disposed as to fairly balance the outlet end of the pipe, and cause the cleaning-pipe to remain in a normal horizontal position.

In Fig. 3 the outlet end of the pipe is shown projecting outward away from the stove. In this position the cleaning apparatus is not in use. By turning the outlet end of the cleaning-pipe around to the cleaning opening the pipe may be projected into the stove over the tops of the flues, the limb and crane-arm taking the position substantially as shown in Figs. 1 and 2. When the outlet end of the pipe is thus projected into the opening, it may be manipulated by means of the counterbalanced end, and the outlet point brought over

any desired flue, the cleaning pipe swiveling upon the joint M, while that joint may move in a horizontal plane in an arc with the joint L as the center, the joint L being at liberty to move in arcs with the bracket-journals as an axis. Making the swivel-joint M of the globe type permits of the outlet end of the cleaning-pipe to be raised and lowered, whereby the outlet end may be brought over any given flue and then projected downward a short distance into that flue. The pipes N and O may be connected at either the top or bottom bearing of the bracket, and the plug P being disposed in the opposite end of the bracket serves to fill the unused inlet-hole in the bracket, and to throw the post of the crane-arm snugly and steam-tight against its seating in the opposite bearing-bracket.

By employing steam in the cleaning operation I soften the deposits, remove them by the blast of steam, and abstract but little, if any, heat from the regenerative brick-work. By combining air with the steam I secure the softening effects of the steam and a blast volume due to steam and air together.

The apparatus may be used while the stove is highly heated, but, obviously, not while the stove is under blast.

To clean hot-blast stoves by air-jets or steam, or both, is old. To effect the cleaning by a pipe inserted through an opening and supported thereat is old. To support the cleaning-pipe by a frame at the top of the stove, the pipe being fitted to revolve and to rise and fall in the frame, and provided with a joint of acticulation below the frame, is old. In these old cases where a pipe was projected horizontally into a cleaning-opening and supported at the opening the support was a mere fulcrum which simply aided in the support, the fulcrum being incapable of supporting a pipe if not aided by the hand of the operator. In other words, the fulcrum-support was a mere rest to partially relieve the operator. In the cases where the frame was employed at the top of the stove the pipe could be supported while within the stove in any of the working or adjusting positions, but no provision was made for the ready removal of the pipe from the stove by means of the mechanism of the supporting-frame, which frame needed to be removed bodily to permit the removal and insertion of the pipe. My system is distinguishable from the old systems in that my pipe-supporting device supports the pipe while it is outside the stove, while it is being inserted into the stove, and while the cleaning is being done. In other words, the supporting device alone—that is, without the aid of the operator—supports the pipe in any of its positions either within the stove or without the stove. The location of the support at the side of the cleaning-opening leaves the same unobstructed for closure or for the insertion of the cleaning-pipe, or for view.

I claim as my invention—

1. The combination, substantially as set forth, with a hot-blast stove having a cleaning-opening and a support thereat, of a crane-arm articulated to such support and adapted to have its free end adjusted to and from said opening, and a cleaning-pipe connected with and supported by the free end of said crane-arm.

2. The combination, substantially as set forth, with a hot-blast stove having a cleaning-opening and a support thereat, of a crane-arm articulated to such support and adapted to have its free end adjusted to and from said opening, a limb articulated to the free end of said crane-arm, and a cleaning-pipe articulated to the free end of said limb.

3. The combination, substantially as set forth, with a hot-blast stove having a cleaning-opening and a support thereat, of a cleaning-pipe connected articulately with such support, and with a source of supply of fluid at an intermediate point in the length of said pipe, and having its outer free end counterbalanced and adapted to serve as a handle for the manipulation of the pipe.

4. The combination, substantially as set forth, with a hot-blast stove having a cleaning-opening, of supporting-bracket E, hollow crane-arm F, hollow limb G, cleaning-pipe H, joints L and M, and pipe N.

VICTOR O. STROBEL.

Witnesses:
A. A. BROCKRUP,
A. KATZ.