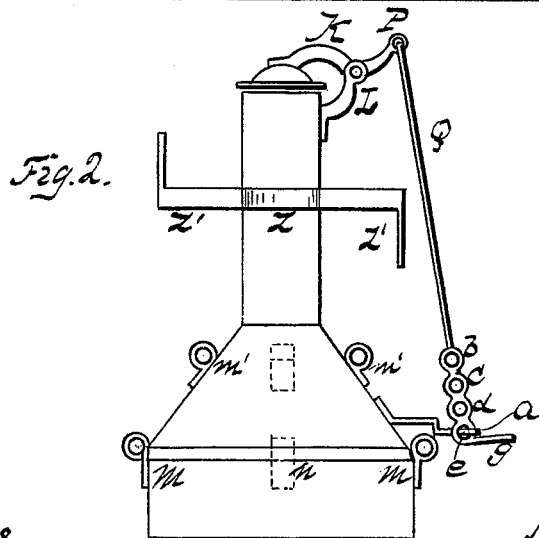
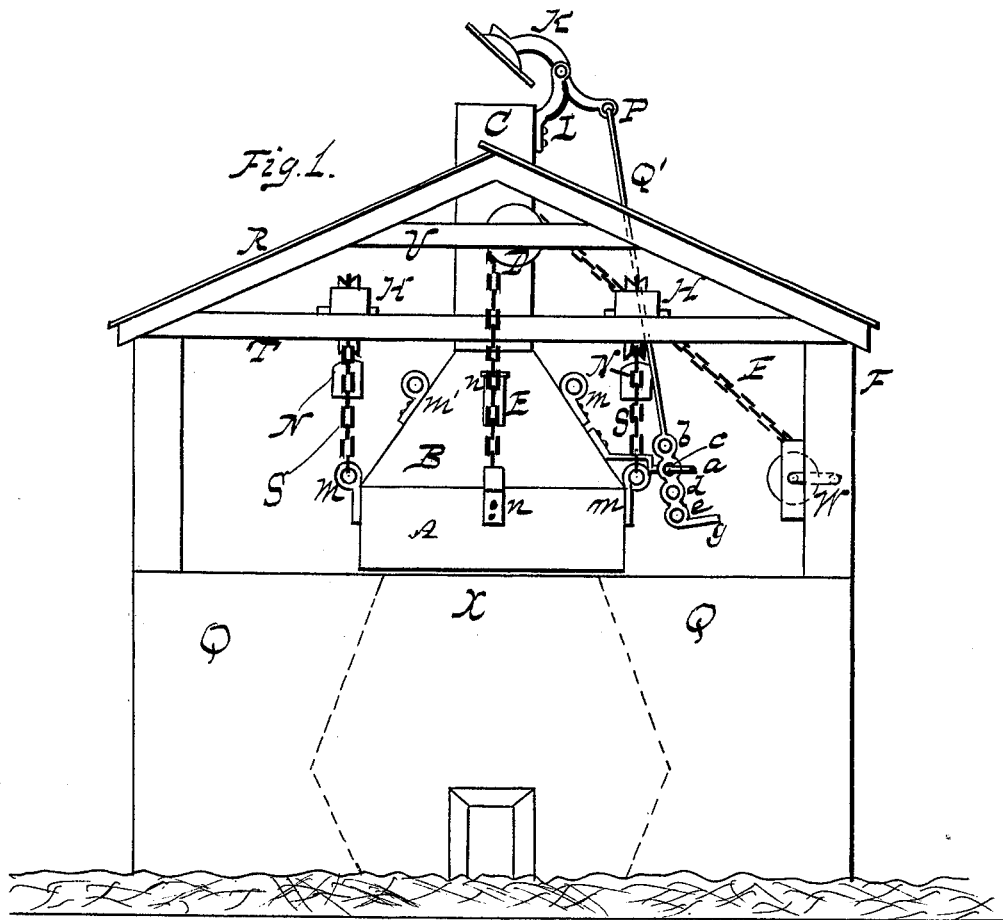


H. HORST.

Draft Apparatus for Lime-Kiln.

No. 220,478.

Patented Oct. 14, 1879.



WITNESSES
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HENRY HORST, OF UNION DEPOSIT, PENNSYLVANIA.

IMPROVEMENT IN DRAFT APPARATUS FOR LIMEKILNS.

Specification forming part of Letters Patent No. **220,478**, dated October 14, 1879; application filed July 21, 1879.

To all whom it may concern:

Be it known that I, HENRY HORST, of Union Deposit, county of Dauphin, and State of Pennsylvania, have invented a certain Improvement in Draft Apparatus for Limekilns, of which the following is a full, clear, and accurate description, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 represents a perspective view of a limekiln with my improved apparatus mounted thereon, and of the kiln-house and parts of the hoist devices mounted on the timbers thereof. Fig. 2 represents a perspective view of the draft apparatus detached from the hoist devices and unmounted.

The novel and distinctive features of my improvement consist, first, in a hoistable stack consisting of a fire-wall or tubular base, to bring the top above the reach of the kiln-fire, a funnel-shaped cap or top, and a tubular flue, all combined into one body, and provided with attaching-hasps and chains, and balancing-weights and windlass for hoisting the stack bodily, to enable the kiln to be supplied with coal and stone, or charged on all sides instead of at doors, as heretofore; second, in a sheet-metal stack for limekilns made of standard, top, and flue united into one body, and provided with balancing-weights and windlass, for operating the stack for charging the kiln, in combination with a guide for the stack, to steady it in its movements while being hoisted and let down.

I construct my draft apparatus of about No. 10 sheet-iron, in substantially the form herein shown, it consisting, mainly, of the cylindrical base or standard A, the conical part B, and the cylindrical stack C, all joined together firmly by riveting. The stack C may be of lighter grade of sheet metal.

The sections A B C compose an inverted funnel, without a door or aperture, whereat the coal and broken stone are admitted into the tunnel-head X of kiln Q, as my device is designed to be bodily hoisted from the kiln-top when it is to be charged, as well as when the heat of the kiln should chance to become too intense, and thus heat the apparatus to a damaging degree.

To lessen the fire risk, however, the part A is added to the funnel proper, so that the exposed part B may be more remote from the kiln-head.

The heat of the kiln in charging it, as experienced where doors are opened, thus causing the charger to be exposed to the gas and flame of the kiln, is also avoided by hoisting the whole funnel bodily from the kiln-head sufficiently to enable the charging to be done beneath it and all around the kiln, to fill its boshes regularly, which cannot be well done through doors, which have hitherto been usually located only on one side of the kiln.

The part B, however, may have an eye-hole with lid provided, whereat the stage of the combustion in the kiln may be inspected.

The stack C is provided with a damper for regulating the draft of the kiln. It is located in my present application on the top of the stack; but it is evident it may be arranged in the said stack below its top, in any approvable way dampers are usually made, my apparatus, however, requiring specially that the set of the damper be effected by coupling the regulating parts thereof with the apparatus in such manner that it may not be disturbed when the draft apparatus is being bodily hoisted, as hereinafter set forth. I usually make it with a lid, K, pivoted to a standard, L, at the top of stack C, and having the extended arm P of lid coupled by rod Q' with the part C by a projecting holder, a, erected thereon, at which, by one of several holes, b c d e, in the said rod Q', the damper is held set variously opened or closed, as desired. In the latter case the kiln and the lime therein, after the burning is completed, are protected against falling weather.

The parts A B of the draft-tunnel are provided with attaching hasps or hooks m n and m' n', respectively, to which are attached chains S, by which are suspended weights N, supported over pulleys H, arranged on the timbers of the kiln-house, substantially as shown, and to which are also attached chains E, by which the draft apparatus may be bodily hoisted, as already set forth, for the purpose of charging the kiln, and for controlling the fire in the same. Said chains are supported

on opposite sides of the tunnel C on pulleys D, arranged in elevated position on the transverse pieces V, or on the rafters R of the kiln-house, and they are connected to and may be wound upon the drum or windlass W, for the purpose set forth—viz., to hoist the draft apparatus bodily from the kiln.

The two extra hasps *m'*, for attaching the balance-weights, and the two extra hasps *n'*, for attaching the hoist-chains, are shown simply to indicate that either set of hasps may be used—that is, either they or the hasps shown as having the chains S and E attached.

The draft apparatus or tunnel, while being let down after being hoisted, is guided to its proper place over the tunnel-head of the kiln by a fixed ring or frame, which loosely incloses the stack C at a sufficient height above the enlarged part B to allow the apparatus to be freely hoisted about four feet above the kiln-head. Said ring or frame Z has extensions Z' Z' thereon, whereby it is fastened to the transverse parts V, or to any other suitable parts of the kiln-house roofing.

The operations of my device have been explained to be simply a vertical hoisting and lowering of the apparatus by a suitable appliance for more conveniently charging the kiln; but its effect is also to save fuel, as the process of burning lime thereby is greatly expedited by effective combustion.

In the present state of the art of lime-burning in kilns surmounted with domes or covers converged to a chimney or flue to improve the draft, the draft structure is allowed to remain stationary on the fire-wall or the skirting about the kiln-head, and is not removed for purposes of charging the kiln, which is done

through doors in said fire-wall or through openings in the cover of the kiln. When the process of burning the kiln is ended, the upper part of the draft structure, composed of cover and flue, is sometimes removed to other kilns, or set out of the way for work at the kiln, and when the refitted kiln is again put in blast it is replaced as before. It is not a hoist structure. My device is attached to said fire-wall, which forms its base, and the whole structure is hoisted at intervals during the process of burning for charging the kiln or varying its draft, as well as for repairs, if such need occurs; and no doors are employed, as they tend to impair the draft, and the charging through them is less effective.

Having clearly and fully described my invention, what I regard as new and useful, and what I desire to secure by Letters Patent of the United States, is mainly embraced in the following claims:

1. The hoistable stack for limekilns, composed of the fire-wall A, the top B, and flue C, united into one body, in combination with balancing-weights N N and windlass W, all attached and operating as and for the purposes set forth.

2. In combination with the sheet-metal stack A B C and the operating-windlass W, the stack-guide Z Z', arranged for operation substantially as and for the purpose described.

In testimony that I claim the foregoing as my invention I have hereunto set my hand and seal this 14th day of July, 1879.

HENRY HORST. [L. s.]

Witnesses:

THEOPHILUS WEAVER,
PETER STUCKER.