P. H. & F. M. ROOTS.

PORTABLE FORGE.

No. 108,941. Patented Nov. 1, 1870.

Fig. 1.

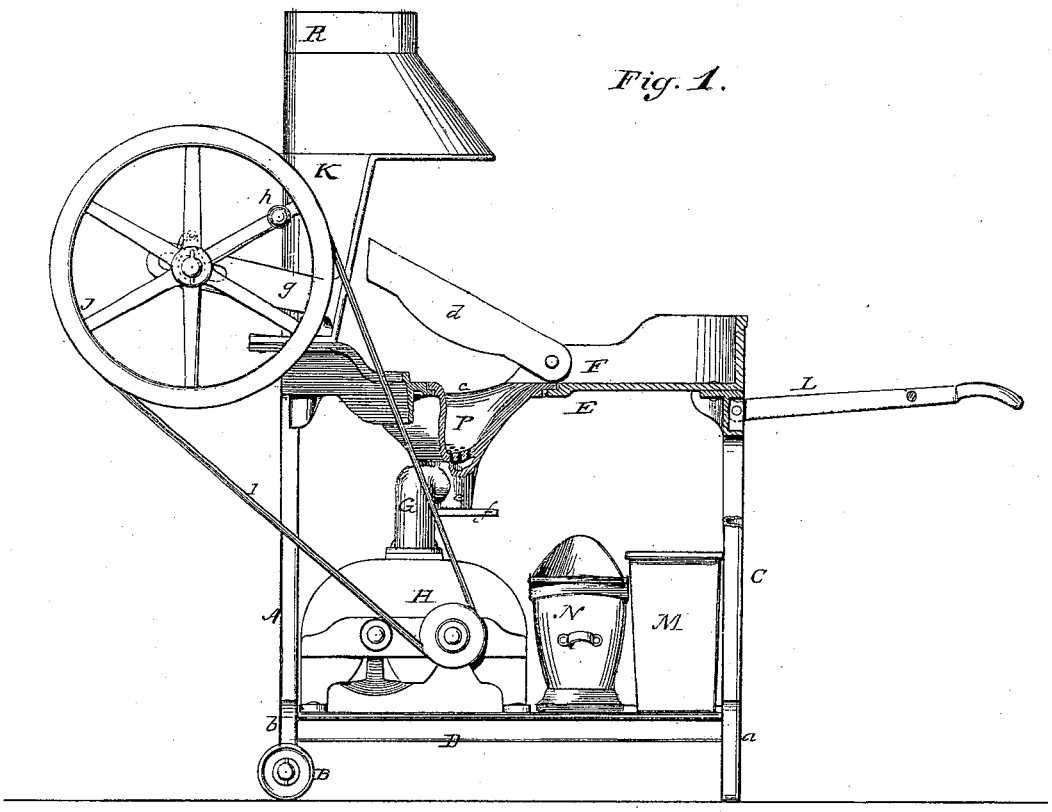


Fig. 2.

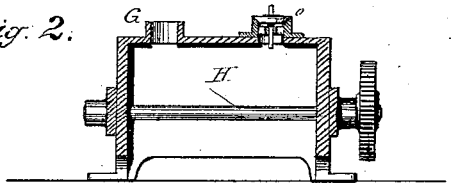


Fig. 3.

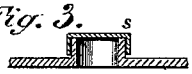


Fig. 4.

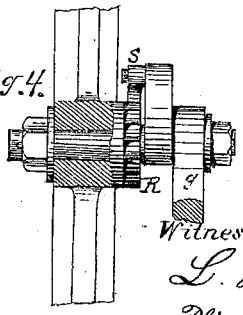
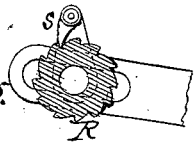


Fig. 5.



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PHILANDER H. ROOTS AND FRANCIS M. ROOTS. OF CONNERSVILLE, INDIANA.

Letters Patent No. 108,941, dated November 1, 1870.

IMPROVEMENT IN PORTABLE FORGES.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that we, PHILANDER H. ROOTS and FRANCIS M. ROOTS, of Connersville, in the county of Fayette and State of Indiana, have invented certain Improvements in Portable Forges, of which the following is a specification, reference being had to the accompanying drawing.

Our invention relates to portable forges, and consists in constructing and arranging in a novel, compact, convenient, and portable shape, a fire-bed, with its hearth and chimney, a blower, with a suitable device for operating it, and with tuyere connecting it to the fire-bed, a coal-hod, slack-tub, &c., all as hereinafter described.

In the drawing—

Figure 1 is a side elevation, partly in section, to show the arrangement of the fire-bed;

Figure 2 is a longitudinal vertical section of the blower; and

Figure 3 is a vertical section of a cap for the blower, that may be used in place of a valve.

Figures 4 and 5 are views of parts detached.

Our forge is constructed entirely of metal, and of any size that may be desired.

We make a frame of two front uprights, A, and two rear uprights, C, with a shelf or platform, D, extending between and connecting them near their lower ends, as clearly shown in fig. 1, and with the hearth E of the forge extended so as to rest upon and be attached to the upper ends of these posts, as shown in the same figure.

The front uprights A are solidly connected to a cross-piece, *b*, on the ends of which wheels B are placed.

The rear uprights C are also connected in like manner to a cross-piece, *a*, the ends of which are turned down so as to form feet for the rear end of the forge to rest upon.

Around the hearth E, which is made oblong, with round corners, or in any other form desired, a raised guard or rail, F, may be placed for the purpose of confining loose coal, or any other article placed thereon.

Near the front end of the hearth E, in an opening suitable for the purpose, is placed a fire-bed, P, made in the form of a concave recess, with its walls curved, and with its bottom provided with perforations opening into a vertical passage, *e*, having a pivoted valve-gate, *f*, across its bottom, for convenience in removing the ashes that may pass from the fire-bed, through its bottom, into this passage, and also to allow the escape of gas when desired.

In the sides of the hearth E, and correspondingly in the fire-bed P, are depressions *c*, for the purpose of allowing long pieces, bars, or rods of iron to be placed lower in the fire, or to the best advantage; and also for the same purpose gates *d* are pivoted on the sides of the hearth, to be turned up out of the way, as shown in said figure 1, when such long pieces are to be placed in the fire.

Over the front end of the hearth E is mounted a chimney, K, with smoke-stack R, for carrying off the smoke from the forge.

On the platform D is placed a blower, H; to be secure, it may be bolted thereon.

From this blower its air-pipe, G, rises first vertically, and then at the proper height bends at right angles and enters the vertical pipe *e* just under the bottom of the fire-bed, so that all ashes or other material that drops from the fire-bed will pass by the open end of the induction-pipe from the blower, so as not to obstruct or interfere with the tuyere-blast.

The blower is operated by a belt, I, which passes over a driving-wheel, J, mounted on an arm, *g*, attached to the chimney K, or in any other suitable manner, as shown in fig. 1.

As gas frequently finds its way into the blower when the forge is not being used, a method for its escape is provided by means of a lift valve, *o*, arranged upon the blower, as shown in fig. 2.

In place of this lift valve an ordinary cap, *s*, as shown in fig. 3, may be used. In the use of either, it will be seen that should an explosion of gas take place, or should the pressure of air become very great, the lift-valve will be raised or the cap blown off; but, in order to prevent the gas generated by the burning coal in the tuyere from entering or being drawn into the blower by any accidental turning of the blower in the wrong direction, we attach a small ratchet-wheel, R, and pawl S, to the hub of the driving-wheel, as shown in figs. 4 and 5. It is obvious that the same devices may be applied to either of the shafts of the abutments, instead of to the hub of the driving-wheel for the same purpose.

On the same platform with the blower is placed securely a slack-tub, M, and loosely a coal-hod, N, as shown in said fig. 1.

To the rear sides of the uprights C are pivoted a pair of arms, L, so arranged that they may be used in lifting the feet on the rear end of the forge free from the ground or floor, and then in moving the forge on the rollers B, when desired. These arms L are also so arranged that they may be turned down out of the way when not in use.

The form or shape of the fire-bed is such as to require no dressing with clay or other material. The bed, being made of cast-iron or other suitable metal, will always keep the shape originally given to it. Its curved sides, in connection with the air-blast, keep

the focus of heat away from these sides, and as their outer surface is constantly exposed to the surrounding atmosphere they are kept comparatively cool.

In the drawing the top plate of the fire-bed is represented as circular, but it is obvious that it may be of any form desired.

While fire-beds, having their walls more or less curved, or even funnel-shaped, may be used, we prefer to employ the combined fire-bed and tuyere made as described in our application for Letters Patent, of the same date with this application. We also prefer to use a blower similar in its construction to that for which Letters Patent were granted to us August 11, 1868, that is, a blower in which two coacting abutments are used, producing a positive blast. In this way we make a complete, compact, convenient, and portable forge.

Having thus described our invention,

What we claim is—

1. The combination of the blower H, having two coacting abutments, and metallic fire-bed and tuyere P, with the mechanical devices for operating same, when constructed and arranged as herein shown and described.

2. In combination with the metallic fire-bed and tuyere P and blower H, the valve O, for preventing explosions, as set forth.

3. A portable forge, provided with the pivoted handles L and wheels B, connected to a single axle, substantially as described, for convenience in moving the forge, as set forth.

4. In combination with the depressions C in the fire-bed and hearth, the guard about the hearth, with a gate, *d*, constructed and arranged substantially as and for the purpose set forth.

5. In combination with the fire-bed or tuyere P and blower H, the ratchet R, and pawl S, when constructed and arranged in connection with the mechanism for driving the blower, substantially as herein described and for the purposes set forth.

PHILANDER H. ROOTS.
FRANCIS M. ROOTS.

Witnesses:
JONATHAN S. MILLER,
HENRY G. JOHNSTON.