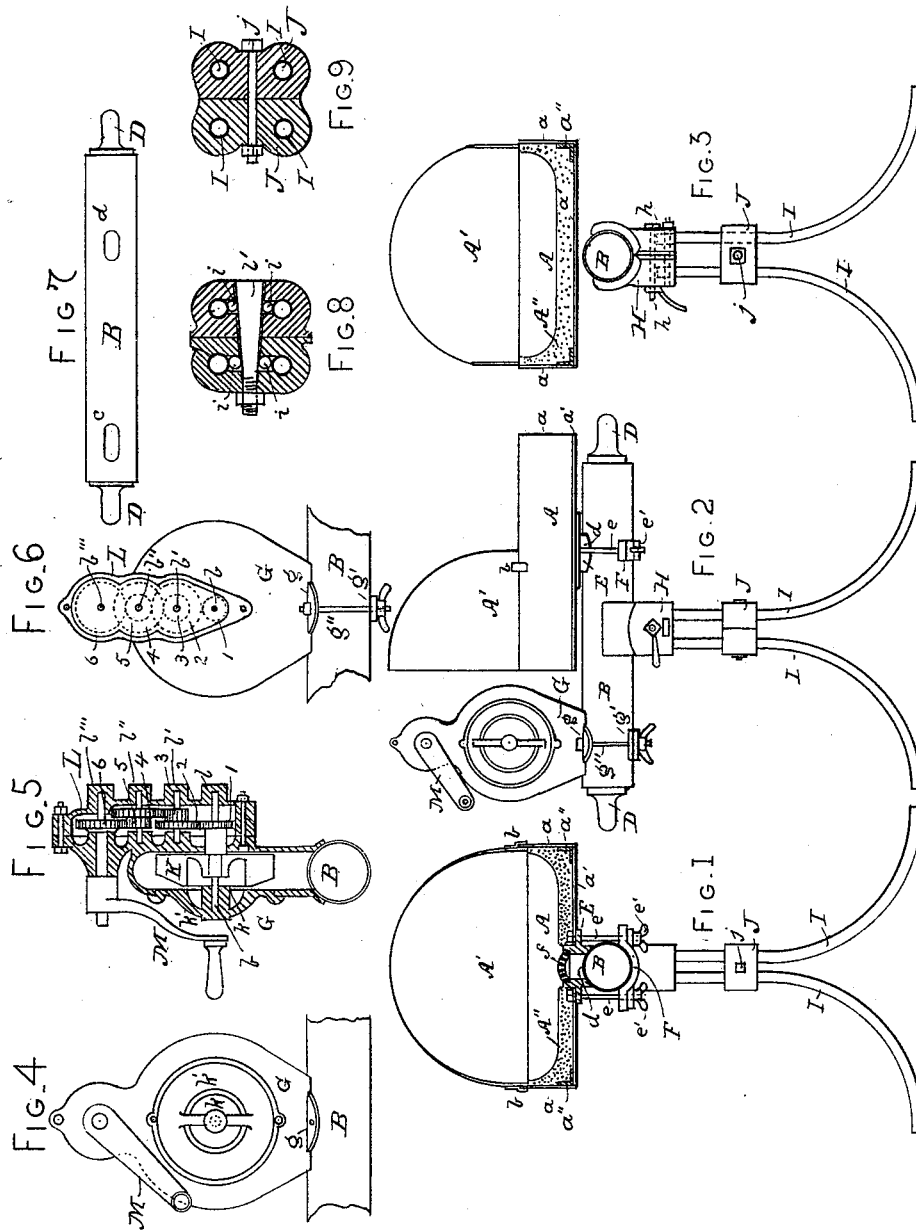


(No Model.)

G. CUMMING.  
PORTABLE FORGE.

No. 386,771.

Patented July 24, 1888.



WITNESSES,  
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# UNITED STATES PATENT OFFICE.

GEORGE CUMMING, OF SAN FRANCISCO, CALIFORNIA.

## PORTABLE FORGE.

SPECIFICATION forming part of Letters Patent No. 386,771, dated July 24, 1888.

Application filed December 22, 1887. Serial No. 253,760. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE CUMMING, a resident of San Francisco, State of California, have invented a new and Improved Portable Forge, of which the following is a specification.

The invention relates to those portable forges the various parts of which may be taken apart and carried from place to place, to be afterward put together and operated with similar effect and as conveniently as stationary forges of equal capacity.

The invention consists, first, in the form and arrangement of the several parts of the forge and the method of securing them together, so that great strength and durability, with lightness and portability, are secured, the operation of taking apart and putting together again may be conducted with great facility, and the apparatus may be kept in good order and cleanly condition without difficulty or delay, and, second, in a certain improvement in the form and arrangement of the shell, toothed gearing, spindles, &c., of the blower producing the blast for the furnace, as will be more fully set forth below.

In the accompanying drawings, which form a part of this specification, Figure 1 is a transverse sectional elevation of the forge, taken immediately in front of the supporting-legs and passing through the center of the hearth. Fig. 2 is a side elevation of the forge. Fig. 3 is a sectional elevation of the forge, taken at a point in front of the supporting-legs and clamp which encloses the horizontal wind-conduit, but back of the center plate of the hearth. Fig. 4 is a front elevation of the blower upon a larger scale than in the other figures. Fig. 5 is a cross sectional elevation of the same, and Fig. 6 is a back side view of this same blower. Fig. 7 is a plan of the wind-pipe, showing the oblong holes, into and out of which the blast passes from blower to forge. Fig. 8 is a sectional plan of clamp H, illustrating the method of keying the legs in the hubs thereof. Fig. 9 is a sectional plan of the clamp J.

In all the figures the same letters of reference are used to indicate the same parts.

In Figs. 1, 2, and 3, A is the hearth, made of a sheet-iron rim, *a*, fastened to a bottom plate, *a'*, by riveting an angle-iron ring, *a''*, to both.

A' is the back plate of the hearth, which fits on the upper edge of the rim and is held in place by little clips *b*. The interior of the hearth is plastered over with clay, A".

B is a horizontal tube giving communication between the blower G and the center opening in the hearth. (See Fig. 1.) Each end of this tube is plugged up with wooden plugs D, and at the proper places holes *c* and *d* are provided in the upper surface of the tube, one hole where the blower is set and one hole where the hearth is secured to the tube. (See Fig. 7.)

E is a circular flange or saddle rested upon the tube B just over the hole *d*.

*e e* are two bolts with thumb-nuts *e' e'* at lower end, and F is a clamp-iron fitting underneath the tube. The bolts pass through the bottom hearth-plate, the saddle-piece E, and the projecting ears of the clamp iron F, as in Fig. 1, so that when the thumb-nuts are screwed up tightly the hearth will be firmly bound upon the tube B.

In the center of the saddle-piece there is a small perforated disk, *f*, through which the air is forced into the fire by the blower, to be distributed in radiating jets in the usual manner.

G is the blower, which is fastened on the tube B in similar fashion as the hearth-pan is fastened. The lower edge of the shell of the blower has a concave surface fitting the surface of the tube, two lugs, *g*, projecting from each side.

*g'* is a clamp-piece passing across the tube B underneath, (see Figs. 2 and 6,) and two bolts, *g''*, with thumb-nuts on lower end connect between the lugs on the blower and the clamp, so that when the bolts are screwed up tightly the blower is held firmly in place.

H is a clamp in two parts, shaped as shown in Figs. 2 and 3, their adjoining surfaces meeting on a line running lengthwise of the tube. Both halves of the clamp have a concave surface encircling the tube, (see Fig. 3,) and the two halves of the clamp are drawn together by the bolt *h*. The lower parts of the two halves of this clamp have hubs which have holes or recesses to receive the ends of the four legs I I I I. These legs are made of gas-pipe and bent to the shape as shown in the draw-

ings, so that their lower part will spread out to give a wide foundation for the apparatus. The legs enter the hub of the clamps about a couple of inches, making a tight fit therein. To hold the legs more firmly in position, short pieces of round iron *i*, Fig. 8, are dropped into recesses in the hub, so that they stand opposite each other and parallel with the ends of the legs, bearing against them. A bolt, *i'*, with a wedge-shaped head, passes between these rollers *i*, so that when the bolt is screwed up, so as to draw this wedge in between the rollers, they necessarily spread them apart and press them as tightly as desired against the legs, thus holding them in position. To further brace the legs together, there are two half-couplings or clamps, *J*, slipped over the ends of the legs before entering them in the hubs of the clamp above. A single bolt, *j*, is used to draw the two half clamps together. (See Figs. 1, 2, 3, and 9.)

The main features of the blower are not new. A blower in some respects similar has already been patented to me July 15, 1884, No. 301,967; but there are important modifications in the manner of construction which render the blower more specially adapted for the purposes of this portable forge.

*G* is the shell, within which the blower fans *K* revolve. The air enters, preferably, on one side only, (although it may be admitted on both sides,) through the opening *k*.

*k'* is the front cover, which is removable to allow the fans to be put in and taken out. In the middle of this cover is a hub to receive the spindle *b* of the fan. At the opposite end of the fan-spindle, after it passes through the back side of the shell, is a toothed spur-pinion, *1*, the other end of the spindle resting in the recess of the lowest boss, *l*, of the back cover, *L*.

There is a train of spur gears, 1, 2, 3, 4, 5, and 6, fitted on spindles *b b' b'' b'''*, said spindles being accommodated in the bosses *l l' l'' l'''*. The upper spindle carries the hand-lever *M*, by which the blower is actuated. The back cover, *L*, incloses all the gears and is bolted to the shell of the blower. It also forms a tight chamber to hold an inspissated lubricant to lubricate both gears and spindles.

What I claim as my invention, and desire to secure by Letters Patent, is as follows:

1. A portable forge consisting, essentially, of the hearth-pan, the hollow conduit for wind, the blower, and supporting-legs, the whole being secured together with suitable clamping devices, as herein described, and for the purpose set forth.

2. In a portable forge, the combination of a hearth-pan securely clamped upon a horizontal wind-pipe, a horizontal wind-pipe conveying the blast from the blower to the hearth, a suitable blower clamped upon said horizontal wind-pipe, and a suitable stand or frame to support the whole, arranged and operating substantially as and for the purpose described.

3. The portable stand herein described, consisting, essentially, of the bent legs inserted and held in the half clamp, the half-clamp constructed and operating substantially as and for the purpose described.

4. As a means of fastening the legs in the clamp hubs, the combination of the wedge-headed bolt and the rollers arranged and operating together to bind the legs in their sockets, substantially as and for the purposes described.

5. In a portable blowing apparatus, the combination of a horizontal hollow wind-conduit, a blower clamped thereto, and a portable stand, as herein described, consisting of the bent tubular legs and clamping-irons, substantially as shown and described.

6. A fan blower, as herein described, consisting, essentially, of a shell inclosing the fan and having a removable cover in front to admit the fans, perforated to allow the air to enter, and with a boss in the middle to receive the fan-spindle, the said shell having a set of bearings secured to rear side to support one end of the spindles of the speed-gears; second, a suitable revolving fan inclosed within the shell; third, a cap or cover with internal space to inclose the speed-multiplying gears, fitted and fastened directly to the shell and provided with bearings for the outer ends of the gear-spindles, and, fourth, a set of speed-multiplying gears with spindles and an operating hand-lever, substantially as described.

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