

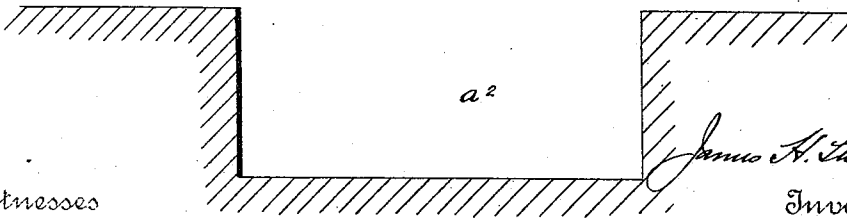
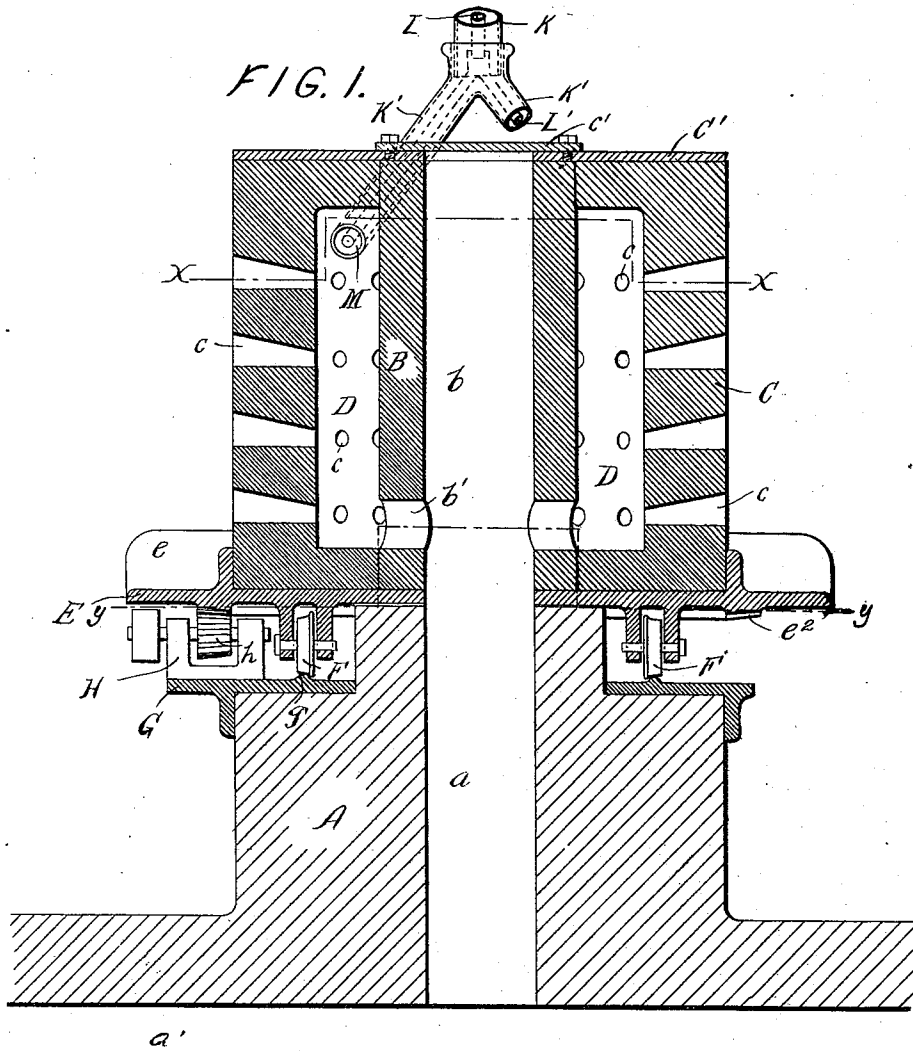
(No Model.)

3 Sheets—Sheet 1.

J. H. STERNBERGH.
FORGE FURNACE.

No. 452,007.

Patented May 12, 1891.



Witnesses

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Caleb J. Breber

Inventor

By *his* Attorney *J. H. Sternbergh*

(No Model.)

3 Sheets—Sheet 2.

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FIG. 2.

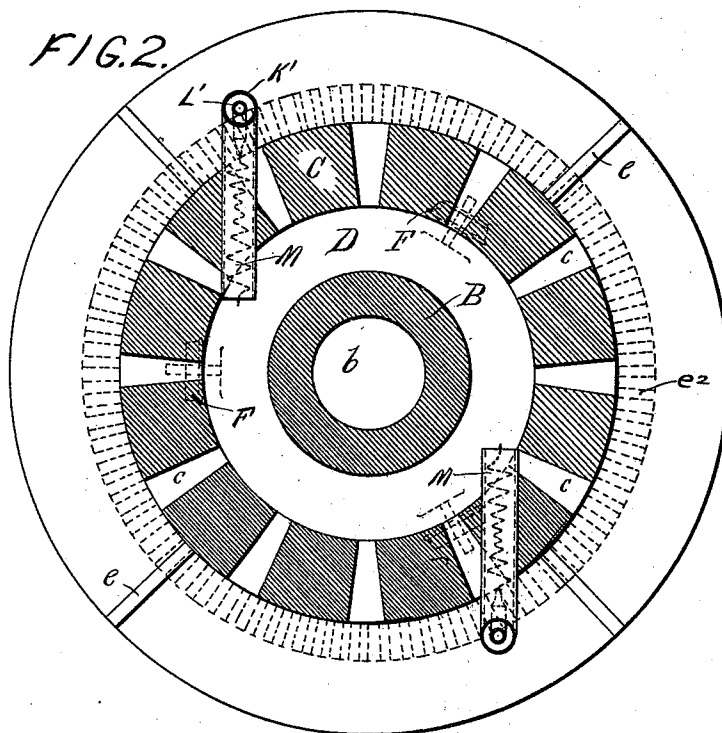
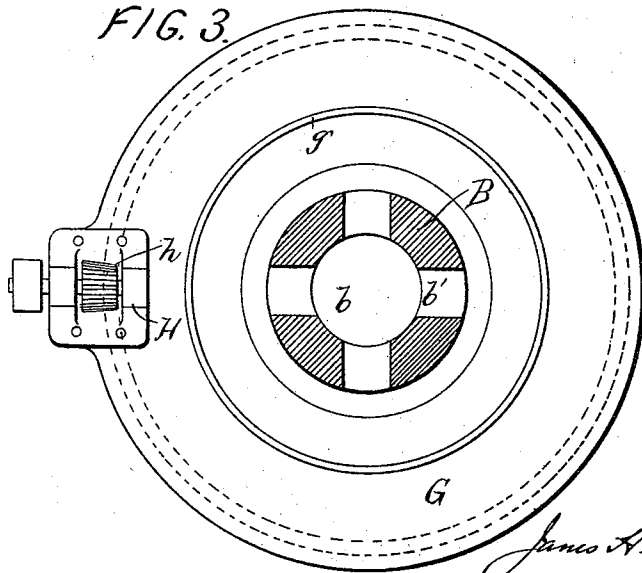


FIG. 3.



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(No Model.)

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FIG. 4.

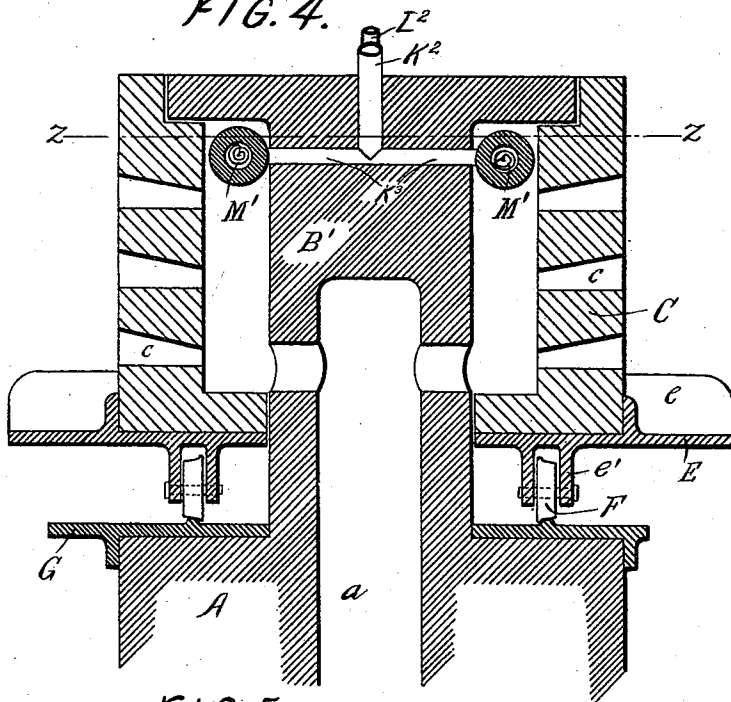
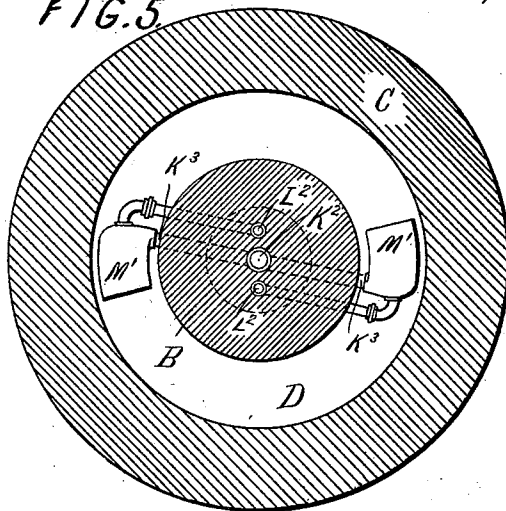


FIG. 5.



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UNITED STATES PATENT OFFICE.

JAMES HERVEY STERNBERGH, OF READING, PENNSYLVANIA.

FORGE-FURNACE.

SPECIFICATION forming part of Letters Patent No. 452,007, dated May 12, 1891.

Application filed August 13, 1890. Serial No. 361,903. (No model.)

To all whom it may concern:

Be it known that I, JAMES HERVEY STERNBERGH, a citizen of the United States, residing at Reading, in the county of Berks and State of Pennsylvania, have invented certain Improvements in Forge-Furnaces, of which the following is a specification.

This invention relates to forge-furnaces for heating blanks from which to form bolts and similar articles. Furnaces of this class have been heretofore employed in which the products of combustion travel upward through an annular heating-chamber, into which the blanks are introduced through perforations in the head of the furnace, which latter might be rotated. Such constructions, however, have several objectionable features, among which may be mentioned the large proportion of heat and escaping products of combustion thrown off from them into the surrounding atmosphere, which render it impracticable for workmen to operate them during very hot weather. The waste and disagreeable odor resulting from the use of liquid fuel in these furnaces, owing to imperfect combustion, are also very objectionable.

The object of my invention is to provide an improved furnace which will obviate these objections and at the same time enable the heat developed to be most effectively utilized and the blanks to be handled with a minimum of labor.

The construction and advantages of my improved furnace are clearly described in connection with the accompanying drawings, and the invention is specifically pointed out in the claims.

Figure 1 is a sectional elevation of a furnace embodying my invention. Fig. 2 is a sectional plan through xx of Fig. 1. Fig. 3 is a sectional plan through yy of Fig. 1, showing the furnace-head and its bottom plate removed. Fig. 4 is a sectional elevation of a modified form of furnace, and Fig. 5 is a sectional plan of the same on the line zz of Fig. 4.

The foundation or standard A is built with a central smoke-flue a , communicating with an underground conduit a' , which may be connected with a number of similar furnaces. The furnace is rotatably supported on this standard, its bottom plate E being provided

with wheels F, which run upon a circular track g on the foundation-plate G. It is rotated by means of a pinion h , secured to a shaft turning in bearings H, which pinion gears with a circular rack e^2 on the bottom plate E.

The head C of the furnace surrounds a hollow cylinder B, the space between the two forming an annular chamber D, closed at the top, but communicating through apertures b' in the wall of the inner cylinder with its central opening b , which latter forms an upward extension of the smoke-flue a .

The bottom plate E, upon which the parts C B are supported and with which they are rotated, extends some distance beyond the periphery of the furnace-head, forming an annular shelf upon which the blanks to be heated may be conveniently placed between the radial partitions e .

The furnace-head C is represented as pierced by four tiers of apertures c , opening radially into the annular heating-chamber D and adapted to receive the blanks to be heated. Near the top burners M M extend horizontally through the wall of the furnace-head and enter the annular chamber D. These burners may be of any desired construction, but are represented as of substantially the form shown in Patent No. 429,414, consisting simply of an air-tube inclosing a central oil-tube and a conically-coiled wire sprayer extending from the oil-nozzle to the end of the air-tube. The extensions K' and L' of the air and oil tubes unite above the center of the furnace to form a connection with the fixed supply-pipes K and L for air and oil, respectively. In the drawings, Fig. 1, this swivel-joint is represented by merely showing the socket portion K^2 of the united air-tubes K' K' inclosing the lower end of the fixed air-supply pipe K and the end of the fixed oil-supply pipe L, similarly inclosed by the union end of the diverging oil-pipes $L' L'$. The top plate C' of the furnace has a central opening corresponding with the central smoke-flue $a b$ and a removable cover c' , which permits access thereto for the purpose of cleaning the walls of the flue, the soot, &c., dropping into the pit a^2 , from which it may be removed from time to time. It will thus be seen that the air and oil enter the furnace at

the top, which is the most convenient point, inasmuch as the supply-pipes are ordinarily carried overhead, and that the products of combustion are carried downward into the underground conduit instead of escaping largely, if not entirely, into the surrounding atmosphere, as is ordinarily the case. In addition to these advantages, however, more complete combustion and utilization of the heat generated thereby results from my construction. The jets as they enter the annular heating-chamber D in a horizontal direction are simultaneously deflected into a circular movement by the curved wall of the furnace-head and also downward toward the outlets *b'* to the central smoke-flue. The resultant of these two forces is a spiral current of heat from each burner around the chamber and downward to the lower outlet, to which current the blanks in each tier, which may be as numerous as is found to be desirable, are subjected. It will be noticed, also, that any imperfectly-sprayed or vaporized oil from the burner instead of escaping drops directly into the intense heat of the chamber and complete combustion is thus secured.

In Figs. 4 and 5 I have illustrated a modified construction in which the central cylinder *B'* is fixed instead of rotating with the head C, and the burners *M' M'* and their oil and air supply pipes *L² L²* and *K² K³* are also fixed.

A single underground conduit provided with a stack or other means of producing a draft, located at any convenient point, may be connected with any number of furnaces and the heated products of combustion very effectually removed, thus making it possible for workmen to operate with comfort in close proximity to the furnace.

What I claim is—

1. In a forge-furnace, the combination, with a hollow standard having a bottom connec-

tion with a smoke-flue and stack, of a furnace-head supported thereon and provided with blank-entering apertures, a cylindrical body located centrally within said furnace-head and arranged to form an annular heating-chamber communicating with said standard, and a fuel-burner in the upper portion of said annular chamber, substantially as set forth.

2. In a forge-furnace, the combination, with a hollow standard having a bottom connection with a smoke-flue and stack, of a furnace-head rotatably supported thereon and provided with blank-entering apertures, a cylindrical body occupying the center of said furnace-head and arranged to form an annular heating-chamber communicating with said standard, and one or more fuel-burners fixed to said rotating furnace-head and entering the upper portion of said heating-chamber, said burners having a swivel connection with fixed air and fuel pipes, substantially as set forth.

3. In a forge-furnace, the combination, with a hollow standard forming a smoke-flue communicating with an underground conduit, of a furnace-head provided with blank-entering apertures and having a hollow body located centrally therein and arranged to form an annular heating-chamber communicating with said smoke flue, and a central upward extension of said smoke-flue having a top opening and means for closing the same, said heating-chamber having a fuel-burner entering its upper part, substantially as and for the purpose set forth.

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

JAMES HERVEY STERNBERGH.

Witnesses:

H. M. M. RICHARDS,
EDWIN L. MOYER.