

T. G. GORMAN & N. W. PEREGOY.
Apparatus for Brazing Metal Tubes.

No. 137,068.

Patented March 25, 1873.

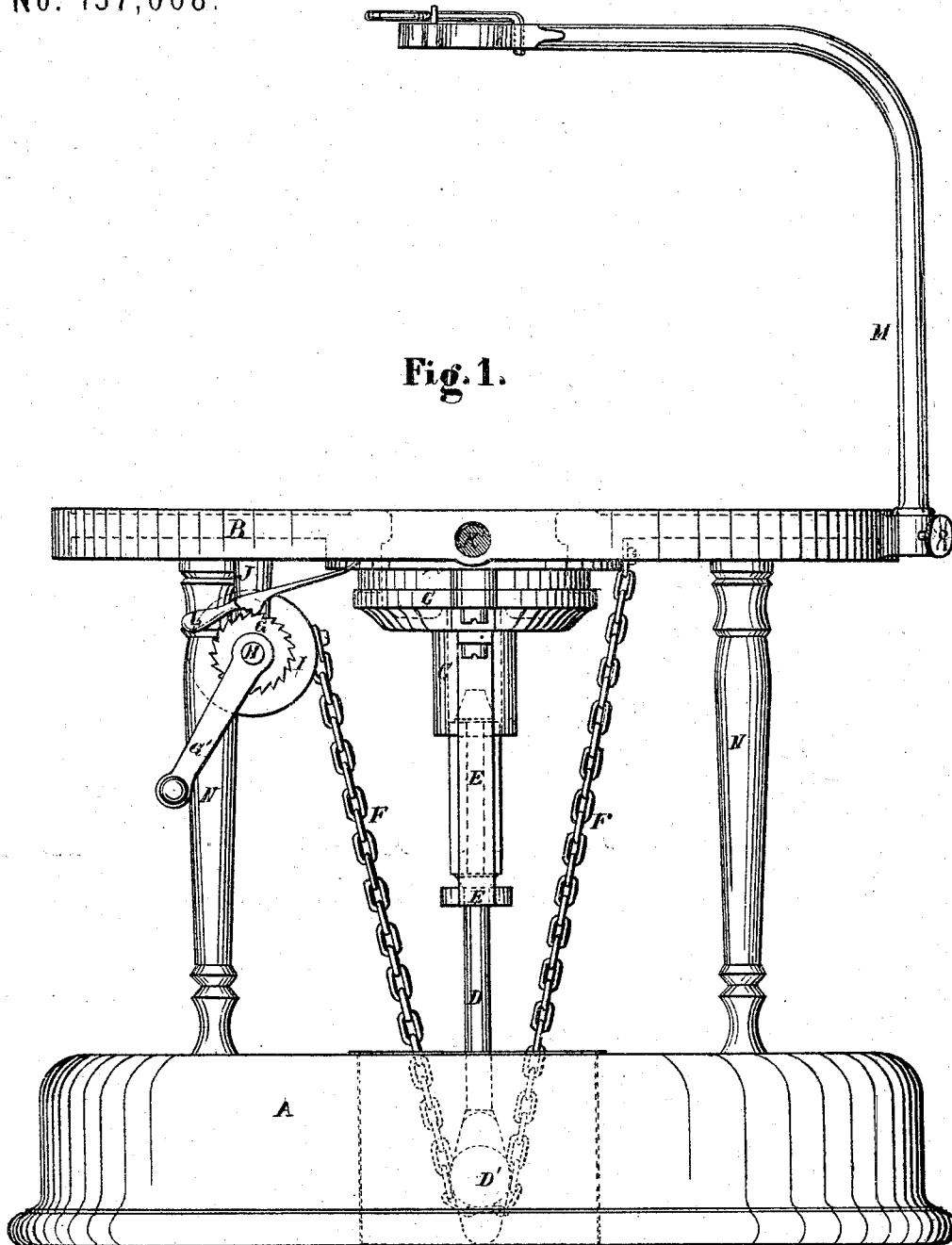


Fig. 1.

Witnesses.

William Craig
John Richter

Inventors.

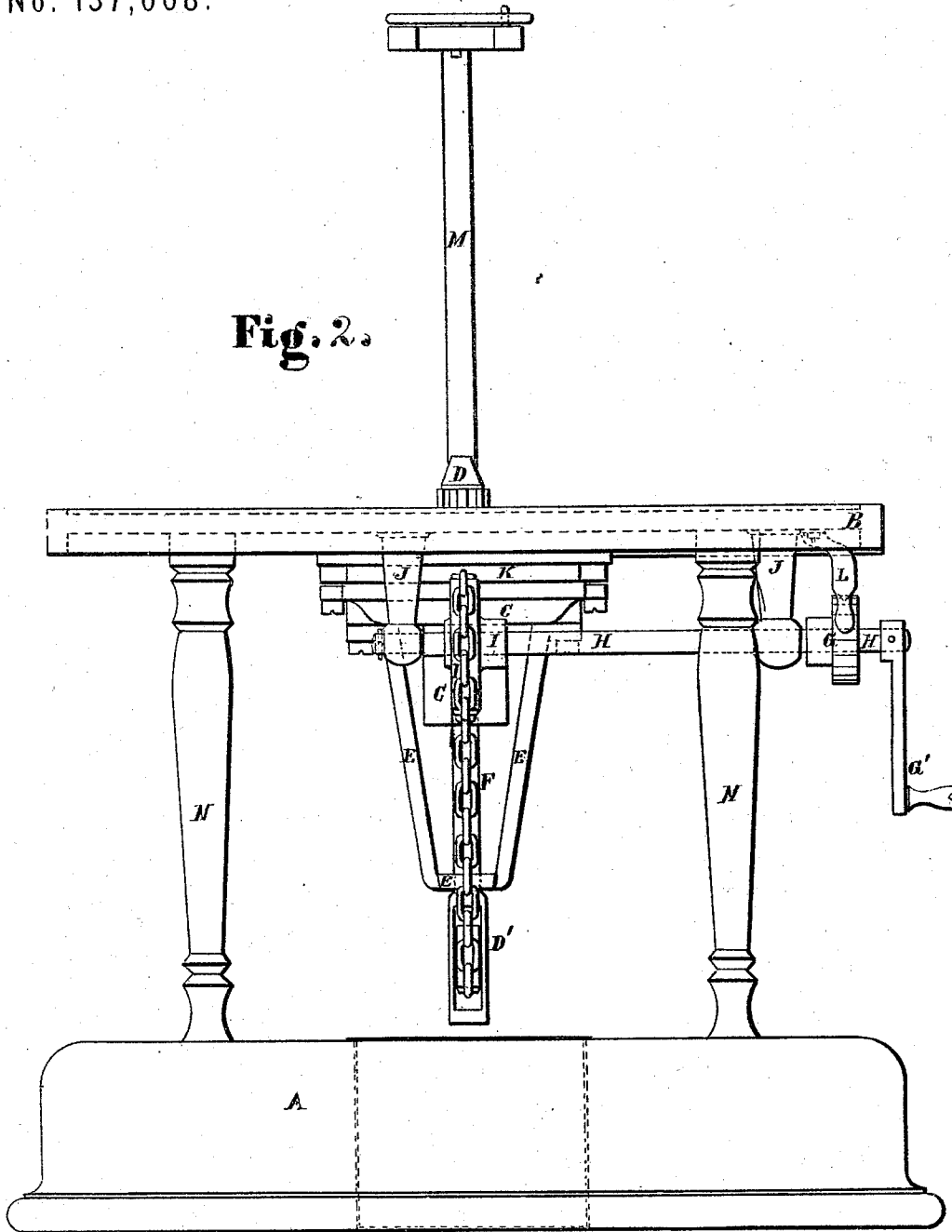
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Fig. 2.



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UNITED STATES PATENT OFFICE.

THOMAS G. GORMAN AND NATHAN W. PEREGOY, OF SPRINGFIELD, ILL.

IMPROVEMENT IN APPARATUS FOR BRAZING METAL TUBES.

Specification forming part of Letters Patent No. 137,068, dated March 25, 1873.

To all whom it may concern:

Be it known that we, THOMAS G. GORMAN and NATHAN W. PEREGOY, each of the city of Springfield, in the county of Sangamon and in the State of Illinois, have invented a new and valuable Improvement in Coppersmith Forges; and we do hereby declare the following to be a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawing making a part of this specification and to the figures and letters of reference marked thereon, and in which—

Figure 1 represents an elevation of the machine; Fig. 2, an elevation, showing another part of the same. Fig. 3 is a top view. Fig. 4 is a transverse section through the line *xy*. Fig. 5 is a view of the plug or spindle. Fig. 6 is a view of the lower end of the plug or spindle, showing the block. Fig. 7 is a top view of the spindle or plunger.

This invention has relation to copper-smith forges; and its object and use is to provide a forge in which ends of one metal may be brazed on tubes of another; or seams in tubes brazed up; or new ends attached to old tubes; or, indeed, any other work which it may be necessary to perform in a forge. Combining, as this forge does, the ability to perform certain kinds of work more easily and rapidly, it still loses none of the features of a common forge, although the range of work possible with it is much increased. This invention is constructed somewhat similar to the ordinary forge, except that it has, directly on the center of the hearth, a fluted plug of iron or steel, rising through a circular hole made central in the cast-iron bottom of a circular central chamber or depression of the hearth. This plug is raised or lowered by means of a chain winding up on a pulley attached to a shaft under the hearth-plate, which shaft can be retained in any desirable position by a ratchet and pawl. The chain, fixed at one end, passes through a block made in the lower end of the fluted plug. When, therefore, the chain is wound up or shortened the block, together with the fluted plug, rises in a vertical direction. Running around the central opening or depression in the hearth-plate is a tuyere-iron, of circular form, its upper part having the opening for the circulation of air, and the lower portion

being solid and square, serving to provide an attachment for the cast-iron bottom of the circular opening. Through the inner side of this tuyere-iron a number of small holes are made, which, when a pressure of air fills the tuyere, allows the air to escape, all the currents tending to converge in a point centrally placed in the circular opening or depression of the hearth.

Having given a general description of our forge, we will now describe the parts more in detail, and explain its method of operation.

Referring to the accompanying drawing, an ordinary hearth-plate, of the form shown at B, is provided, with legs at N, or a base of some suitable shape. The hearth-plate B has cast on its under side an air-passage, K¹. The central portion of the hearth-plate is removed, leaving an opening circular in form, around which the tuyere-iron K runs, forming a complete ring, in which the opening K' is in connection with the opening of the pipe cast on the bottom or under side of B. A number of small holes are made through the inner side of the tuyere-iron for the egress of the air, as seen at K, Figs. 3 and 4. This circular opening in the hearth B has a bottom, C, Figs. 1, 2, 3, and 4, made of cast-iron or any other suitable material, attached by screws to the under side of the tuyere-iron K. The central part of C is provided with a circular opening, C', having on its lower part a deep flange, forming a guide to any object sliding upward or downward through C'. Attached to C is a guide, E, Figs. 1, 2, and 4, screwed to the outer edge of C. The guide E has two legs, so to speak, and at the bottom or lower part these legs are connected by a cross-piece forming part of E. This cross-piece has a hole through its center smaller than C', but directly central and under C'. Sliding through C' is the fluted plug D, Figs. 1, 2, 3, 5, 6, and 7. In Figs. 5, 6, and 7, the construction of this plug is shown in detail. The upper or larger end is slightly conical, then cylindrical and fluted, as seen at Figs. 5 and 7, like the lands and grooves in the interior of a rifle-barrel, except that these run straight and not spirally. The largest diameter of this portion of the plug is of such size that it can slide easily in the opening C', Fig. 4, of the bottom C. The central portion of the plug is simply circular in sec-

tion and smaller than the fluted portion, and of such size that it can slide in the hole provided in the lower part of the guide E, Figs. 1 and 2. The lower portion of the plug is provided with a block made in the metal itself, having a sheave, D', Figs. 1, 2, 5, and 6, pinned in. This plug, as here represented, is in one piece, but to enable the apparatus to be put together, the upper or fluted portion of D is usually screwed fast to the smaller central portion of the plug. In Figs. 1 and 2 the plug D is shown in position, the upper or fluted portion being in the hole C', the central smaller part sliding in the hole in the lower part of E. The block and sheave at the lower part can rise and fall as the plug is raised or lowered, either till the upward motion of D is arrested by the blocks coming into contact with the lower part of E, or its downward motion arrested by the bottom of the opening in the base of the apparatus A. The plug D is elevated and lowered by the chain F, Figs. 1 and 2. One end of the chain is fixed to the hearth's lower side, then passes downward around the sheave D', and then upward to the pulley I on shaft H, Figs. 1, 2, and 3. By turning the cranked handle G', the shaft H is revolved, and the chain wound up on the pulley I. On H, next to the handle G', there is a ratchet-wheel, G, which keeps the chain from unwinding when once wound up, by catching its teeth with the pawl L, made with a spring, and pressing on the surface of the ratchet-wheel. The shaft H is held in position by two inverted bearings J, Figs. 1 and 2.

It will be observed that when the chain is wound up to its greatest extent, as in Fig. 2, the top of the block on the lower part of D is close to the lower part of the guide E, and the upper conical and fluted portion of D is some little distance above the level of the hearth-plate. When the chain is unwound, as in Fig. 1, the pulley on D rests against the ground, and the top of D is completely within C', the circular opening in C.

For the purpose of brazing an end on a tube after the usual provisions are made for holding the two portions together and retaining the spelter in position, the chain F is allowed to unwind and the plug D to fall to its lowest point, the end of the tube resting on the upper and conical portion of D, the part to be brazed thereby being brought within the circular opening in the hearth. The fire being now prepared, or, perhaps, having been already so, the operator rests the upper end of the tube against the Y-shaped projections made on the upper end of the arm M, which serves to retain the tube in its proper vertical position. The air-blast comes into the opening K', circulates through K, and finds egress at k, blowing the fire, which is both on the hearth as well as packed into the circular opening around the tube.

It will be observed that the air makes the

fire hottest just at the point where the work has to be done.

After a sufficient time has elapsed, the workman, holding the cranked lever G', gradually winds the chain F on the pulley I, turning the shaft H, and raising the plug D, carrying along with it the tube. In this way the various portions of the work can be gradually brought in contact with the hottest part of the fire.

When the brazing is completed, the chain F is fully wound up on I, and the tube, being raised above the fire, can be allowed to cool. After this operation, another tube, prepared for brazing, can be placed in position on the top of D and lowered down through the hole formed in the fire, and then gradually raised till finished, and then elevated to the greatest extent, and permitted to cool. In this way tube after tube can be inserted and the operation repeated any number of times, the fire not having to be disturbed at each successive operation, thereby saving the workman much trouble, and preventing him from the inconveniences of a bright, scorching heap of live coal, as was the case when the fire had to be raked back at each successive operation.

It will be observed that the fluting or grooving of the upper portion of D is to prevent the ashes and cinders from making the plug D stick as it slides through the hole C', a slight shake sufficing to free it from any substance tending to prevent its easy and unobstructed motion.

The arm M is pivoted in a hole made in the side of B, and has a horizontal motion over the surface of B, thus enabling such tubes as have their parts to be joined at an angle with the central line to be put into the fire at an angle and raised at that angle through the hottest portion of the coals.

When any other kinds of forging or brazing have to be done, this apparatus will act as a common forge, and no obstacles will arise, but, on the contrary, for certain kinds of work, great advantages will present themselves.

Having described our invention, what we claim, and desire to secure by Letters Patent, is—

1. A forge, in combination with the fluted plug or spindle D, substantially as herein described.

2. The chain F, pulleys I and D', shaft H, pawl L, ratchet G, and crank G', for raising and depressing the spindle D, for the purposes herein described.

3. The circular opening in the hearth B, tuyere K, bottom C, and hole C', substantially as herein described, and for the purposes herein set forth.

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NATHAN W. PEREGOY.

Witnesses:

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POLK COOPER.