(No Model.)

D. O'NEIL.

METAL BORING DEVICE.

No. 266,306. Patented Oct. 24, 1882.

Fig. 1.

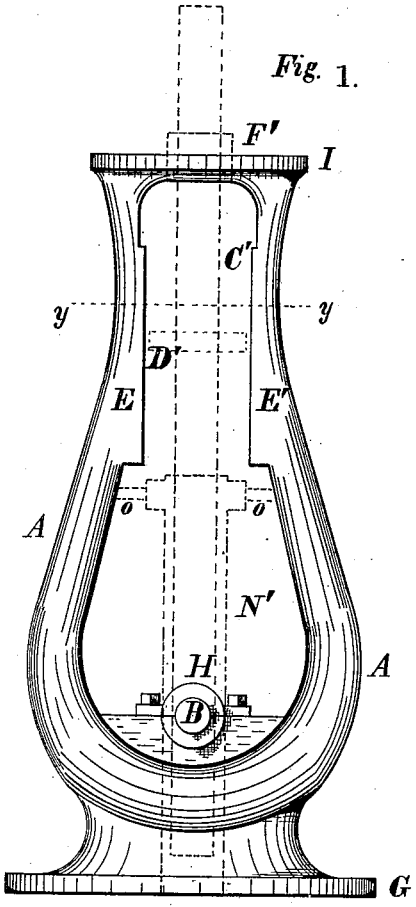


Fig. 2.

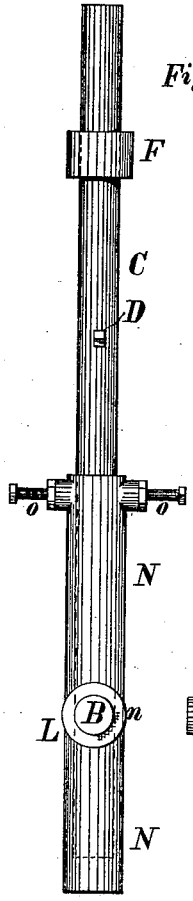


Fig. 3.

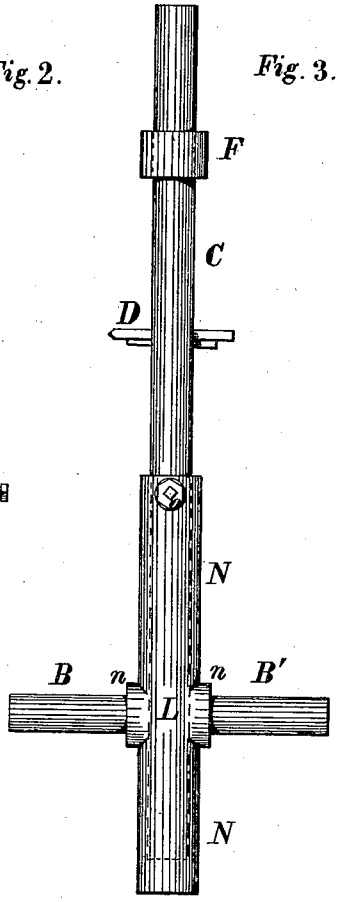


Fig. 4.

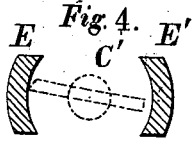


Fig. 7.

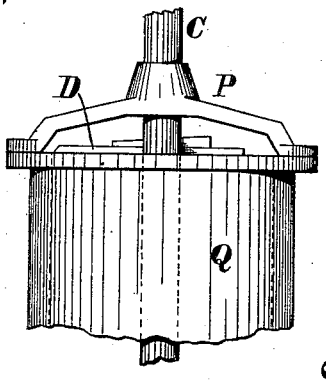


Fig. 5.

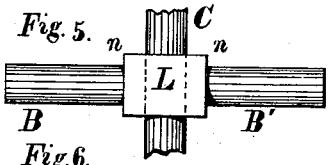
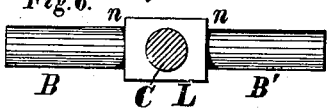


Fig. 6.



WITNESSES-

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UNITED STATES PATENT OFFICE.

DANIEL O'NEIL, OF ROCHESTER, NEW YORK.

METAL-BORING DEVICE.

SPECIFICATION forming part of Letters Patent No. 266,306, dated October 24, 1882.

Application filed May 17, 1882. (No model.)

To all whom it may concern:

Be it known that I, DANIEL O'NEIL, of Rochester, Monroe county, New York, have invented an Improved Boring Device for Engine Guides or Cylinders, of which the following is a specification, reference being had to the annexed drawings.

In the construction of steam-engines as heretofore practiced great difficulty has been encountered in securing the proper lining of the cylinders and guides with each other and with the axis of the crank-shaft.

My invention has for its object the removal of the above difficulties; and to this end it consists in a novel mode of securing the accurate position of the parts in question by means of a trunnioned guide which, during the boring operation, occupies the position of the crank-shaft and serves to guide the boring-bar at right angles therewith in a mathematically correct manner.

My invention also consists in the combination, with the trunnioned guide, of a boring-bar arranged to move relatively thereto, and in various details of the device, all as hereinafter more fully set forth.

My improvements in apparatus for boring engine guides and cylinders are represented in the accompanying drawings, in which—

Figure 1 is a side elevation of an engine-frame, the dotted lines representing my improved device in position for use. Figs. 2 and 3 are side views of my improved boring device, taken at right angles with each other. Fig. 4 is a section through the engine-frame on the line *y y*, Fig. 1. Figs. 5 and 6 represent the trunnioned guide for the boring-bar. Fig. 7 represents my improved boring device applied to boring cylinders.

In the accompanying drawings, A A represent the engine-frame; B B′, the trunnions of the guide L; C, the boring-bar; D, the boring-tool; E E′, the cross-head guides; F, the collar which supports the boring-bar in the cylinder end of the engine-frame.

My improved boring device is represented in the drawings in use on a frame of the type which is now usually adopted in the construction of upright engines, which consists of a base, G, curved sides A A, provided with guides for the cross-head E E′, two journal-boxes, H, one on each side of the crank, and a circular plate, I, against which the cylinder is bolted.

My improved boring device consists of the guide L, Figs. 5 and 6, provided with the trunnions B B′, and having an opening in it at right angles with the trunnions, through which the boring-bar C slides. The trunnions B B′ are of the same diameter as the crank-shaft, and the guide L is provided with shoulders *n n*, which project at right angles with the trunnions, and the outside faces of which are the same distance apart as the outside faces of the crank which is to be employed in the journal-boxes.

The boring-bar C is provided with a boring-tool, D, and one or more collars, F, which fit tightly in the opening in the flange I. The boring-bar C revolves in the collar F when the device is in use. The opening in the guide L, through which the boring-bar passes, is located centrally between the shoulders *n n*.

The guide L may be prolonged either way on the boring-bar, forming a sleeve, N, surrounding the bar, and it may be provided near the cross-head guides E E′ with screws *o o*, by which it is braced against the inner sides of the engine-frame when in position therein. The lower end of the sleeve N, passing through the base G, contains a center to swing it in the lathe.

In the construction of the boring device it is necessary that the boring-bar should stand accurately at right angles with the trunnions.

A convenient mode of conducting the boring operation is as follows: The trunnions of the guide are fitted to the journal-boxes, the inside of which is dressed off to fit the shoulders *n n*, while the boring-bar is held central in the opening in the flange I by means of the collar F. The boxes are then babbitted. The engine-frame is then put in the lathe on the centers of the boring-bar and sleeve, and the flange I turned off and faced up, after which the flange G is held up to the live-center of the lathe by straps and bolts through the face-plate, the center rest of the lathe is put on, (the boring-bar and collar F being removed,) the hole in the flange I is bored out true, another collar, fitting the hole in flange I, is then inserted, the boring-bar again introduced, and

the guides E E′ bored out, the bar being fed forward by the tail-spindle or the lathe-carriage.

The position of the boring device in the engine-frame during the operation of boring the guides is represented by the dotted lines C′ D′ N′ F′ in Fig. 1.

The boring operation may also be conducted under an upright drill when desired. If the guide L is employed without the sleeve N, it may be necessary in doing the work in a lathe to use a center in the base G, or to bolt the base to the face-plate.

To bore the cylinder of an engine with the same appliances, the cylinder should be bolted onto the frame or uprights, the boring-bar introduced, and an offset-bearing, P, Fig. 7, to support the boring-bar, secured to the outer end of the cylinder, and the cylinder is then bored out by causing the boring-bar to revolve by means of a pulley splined thereon, the feed being obtained by a screw acting against the end of the bar. In this case the lower or inner end of the boring-bar is supported by the trunnioned guide L. This arrangement may also be advantageously used in reboring cylinders which have become worn without removing the cylinder from the engine-frame.

It is obvious that my improved boring device may also be employed on engines having an overhung crank by using one of the trunnions only, and I do not intend to confine my invention to its application to engine-frames of the form herein shown.

A great saving of labor is accomplished by the use of my improved boring device for engine guides and cylinders, the old-fashioned method of lining up the parts by means of a fine cord stretched through the cylinder is entirely dispensed with, and perfect accuracy in the fitting is insured.

My improved device may also be used to detect imperfect lining in engines already constructed by putting the trunnioned guide into the journal box or boxes, screwing down the caps, collars being inserted in the upper end of sleeve N, through which a rod of the same diameter as the piston-rod is passed, after which the proper alignment of the guides may be determined by the calipers; or an adjustable pointer or other suitable device may be applied to the rod. The insertion of the rod into the guide will also show whether the journal-boxes are in the proper position.

I claim—

1. The improved boring device herein described, consisting of the trunnioned boring-bar guide L, substantially as and for the purposes set forth.

2. The combination of the sleeve N, provided with trunnions B B′, and the boring-bar C, substantially as described.

3. The combination of the trunnioned guide L, provided with shoulders *n n*, and the boring-bar C, substantially as described.

4. The combination of the trunnioned guide L, boring-bar C, and collar F, substantially as described.

5. The combination of the sleeve N, provided with trunnions B B′ and screws *o o*, and the boring-bar C, substantially as described.

DANIEL O'NEIL.

Witnesses:
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