Jan. 8, 1929. 1,698,394

E. E. DAVIS

BORING DEVICE

Filed May 31, 1923 2 Sheets-Sheet 1

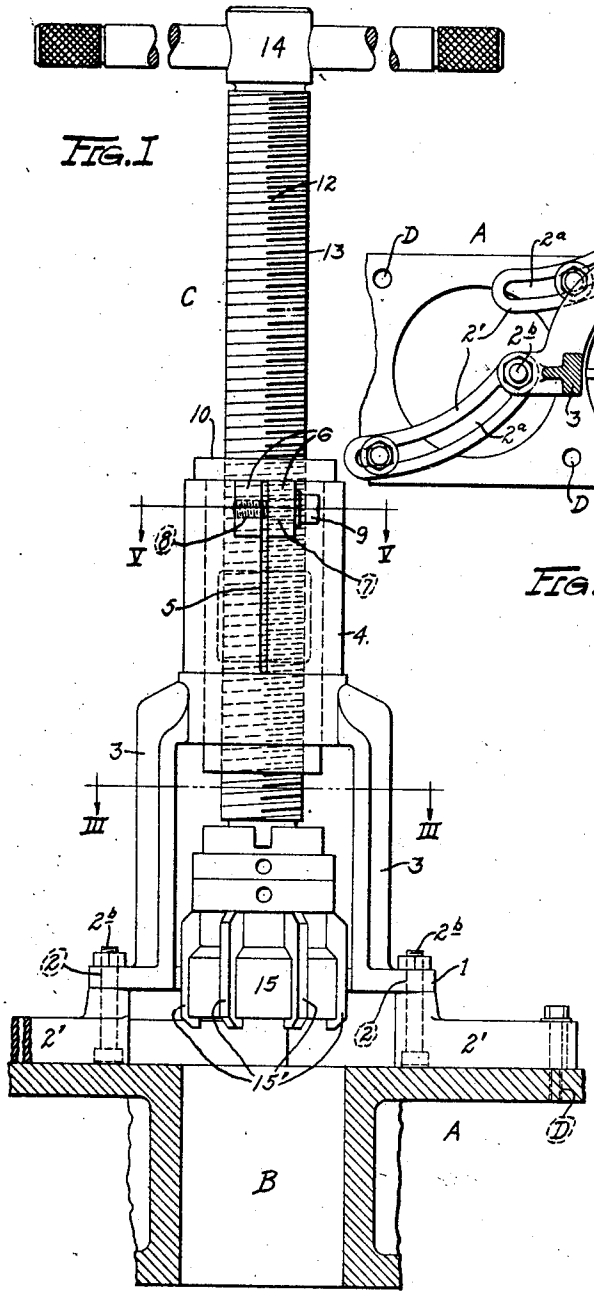


FIG. I

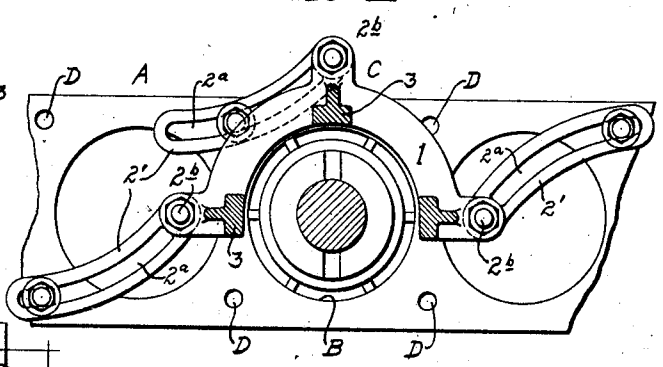


FIG. III

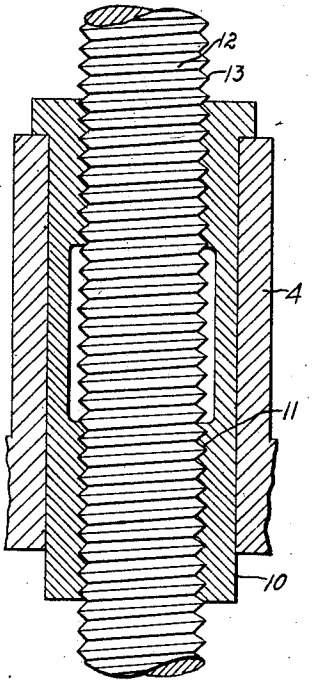


FIG. II

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FIG. IV

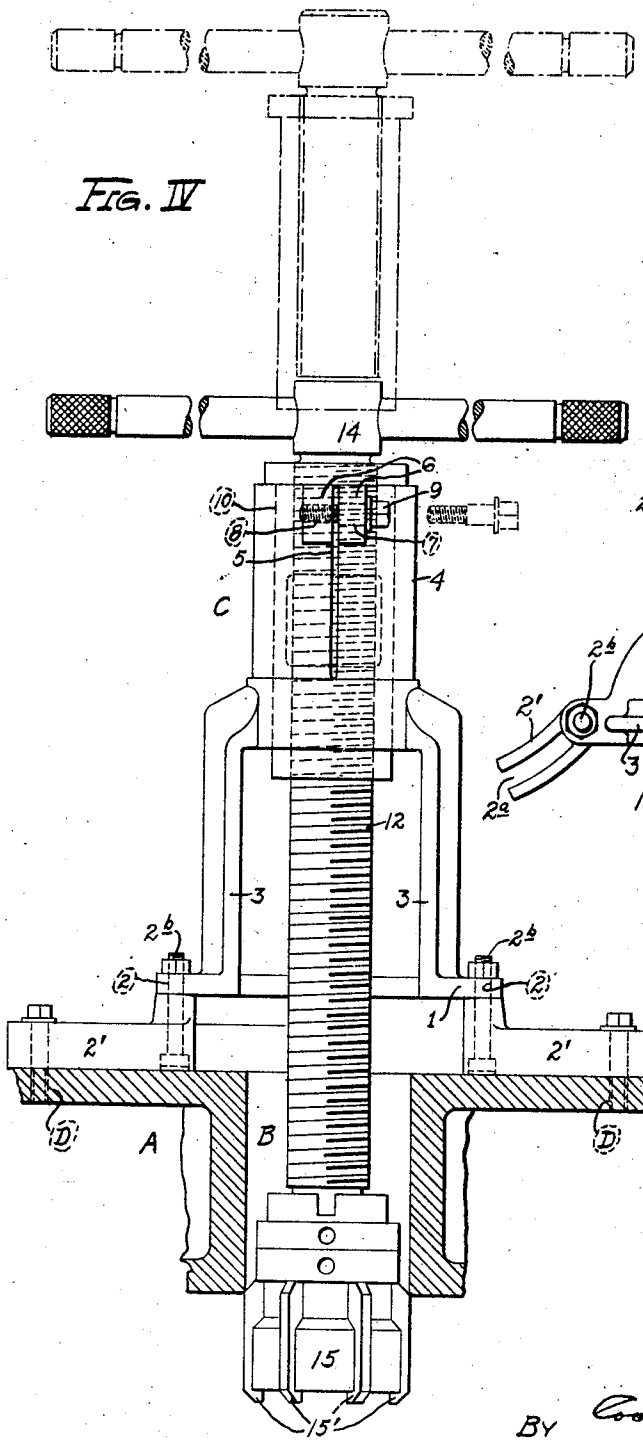
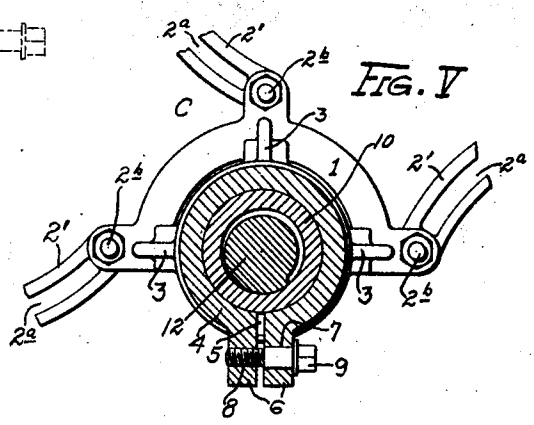


FIG. V



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UNITED STATES PATENT OFFICE.

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BORING DEVICE.

Application filed May 31, 1923. Serial No. 642,614.

This invention relates to improvements in boring devices, and particularly to a simple boring device which may be used in finishing and reboring the cylinder bores of internal combustion engines. As is well known, it is often necessary after an internal combustion engine has been in use for some time to rebore the cylinder bores thereof, and heretofore it has been necessary for the mechanic performing this work to be provided with expensive and comparatively complicated equipment. The device disclosed in the present application is inexpensive to produce and is of comparatively simple construction, and said device will rebore a cylinder bore as efficiently as the more expensive devices mentioned above.

With the foregoing and other objects in view, the invention comprises the novel construction, combination and arrangement of parts hereinafter more specifically described and illustrated in the accompanying drawings wherein is shown the preferred embodiment of the invention. However, it is to be understood that the invention comprehends changes, variations and modifications which come within the scope of the claims hereunto appended.

Fig. I is a side elevation of my improved boring device, showing same arranged above a cylinder bore of an internal combustion engine.

Fig. II is an enlarged fragmentary section of the portion of the device through which the threaded tool-carrying shaft passes.

Fig. III is a section on line III—III of Fig. I.

Fig. IV is a side elevation of the device, showing the device after the cutting member thereof has passed through the cylinder bore.

Fig. V is a section on line V—V of Fig. I.

In the drawings, A designates a fragment of an internal combustion engine and B one of the cylinder bores thereof. My improved boring device C is supported by the internal combustion engine in a position immediately above a cylinder bore B, the cylinder head of said internal combustion engine being removed so that the cutting tool of said boring device may be moved downwardly into said cylinder bore. The body of the internal combustion engine is provided with threaded openings D which receive the fastening devices by which the cylinder head is secured to said engine body, and these threaded openings are utilized to receive the fastening devices by which the boring device C is secured to the engine. The boring device C comprises a base plate 1 which preferably comprises a semicircular member provided with a plurality of outwardly extending ears, each of which is provided with an opening 2. Arranged below the base plate 1 is a plurality of curved arms 2′, each of said arms 2′ being provided with a slot 2^a extending longitudinally of said arm, and each of said arms being secured to the base plate by means of a bolt 2^b which passes through an aperture in said arm and through the associated opening 2 in the base plate 1. To secure the boring device to the body of the internal combustion engine, the arms 2′ are arranged so that portions of the slots 2^a register with the openings D in the body of engine A, and suitable bolts are then passed through said slots 2^a and screwed into the threaded openings D in the engine body, whereby said boring device is firmly clamped in place on said engine body. Extending upwardly from the base plate 1 is a plurality of arms 3 preferably formed integral with said base plate. Located at the upper ends of the arms 3, and preferably formed integral therewith, is an elongated clamping head 4, said head being provided with a slit 5 which extends downwardly from the top edge of said head 4.

A pair of ears 6 are formed on the head 4, one of said ears being formed at each side of the slit 5 at the upper end thereof. The ears 6 are each provided with an opening, there being a smooth opening 7 in one of said ears and a threaded opening 8 in the other of said ears. 9 designates a bolt provided with an enlarged head portion, said bolt being adapted to be passed through the smooth opening 7 and screwed into the threaded opening 8, the enlarged head portion of said bolt being adapted to bear against the outside face of one of the ears, whereby said ears are drawn together when the bolt is rotated in one direction and permitted to move apart when said bolt is rotated in the opposite direction.

Located within the head 4 is a sleeve 10, said sleeve being clamped in place by the bolt 9 which draws the ears 6 together and causes the diameter of the split head 4 to be reduced, whereby said sleeve 10 is tightly gripped within the head 4. The sleeve 10 is provided with an annular flange at its upper

end, which is adapted to bear against the upper face of the bearing 4, and said sleeve is internally threaded, as indicated at 11, for a purpose to be hereinafter set forth. Extending downwardly through the sleeve 10 is a shaft 12 provided with threads 13, said shaft being provided at its upper end with an operating member 14 and at its lower end with a cutting tool 15.

The operation of my device is as follows:

Assume that the boring device has been properly located above the cylinder bore to be rebored. The threaded shaft 12 is rotated by means of the member 14, and due to the fact that the threads 13 on the shaft 12 engage the threads 11 in the sleeve, said rod will move vertically relative to said stationary sleeve, consequently rotation of said rod in the proper direction will cause said rod to move downwardly. The cutting tool or reamer 15, as has been stated, is secured to the shaft 12, hence the downward movements of the rod 12 will cause said reamer to be simultaneously rotated and moved axially through the bore B, and as the cutting members 15′ of said reamer are in contact with the wall of said bore, the surface thereof will be removed. After the cutting tool reaches the position in which it is shown in Fig. V of the drawing, the boring operation has been completed, and it is then desired to withdraw the cutting tool from the bore B. If it were necessary to withdraw the cutting tool from the bore by reversing the direction of rotation of the threaded shaft 12, much time would be consumed, but the loss of time is avoided in the device disclosed in the present application in the use of which it is only necessary to unscrew the bolt 9, thus permitting the head 4 to expand, thereby releasing the frictional grip between the inside face of said head and the outside face of said sleeve. The operating handles may then be grasped and as the frictional grip between the head 4 and the sleeve 10 has been released, said shaft, sleeve and cutting tool may be drawn upwardly until said cutting tool has been removed from the engine bore.

By the use of the curved arms 2′ it is apparent that the device may be used to rebore the cylinder bores of engines of various sizes, it only being necessary to unscrew the nuts on the bolts 2^b to permit said arms 2′ to be swung pivotally relative to the base plate 1, so that portions of the slots of said arms may be brought into registration with the threaded openings D in the engine body. This arrangement is necessary because, as is known, the threaded openings D are in different relative positions on engines of different sizes. It is, of course, also plain that cutting tools of different sizes will have to be used for cylinder bores of different diameters, and the cutting members used in connection with my device will be attached to and detached from the lower end of the shaft 12 in the usual manner.

I claim:

A boring device comprising a cutting tool, a threaded shaft to which said cutting tool is attached, means comprising a non-expansible internally threaded member through which said threaded shaft passes, an expansible and contractible head within which said internally threaded member is located, said non-expansible internally threaded member being provided with a flange which contacts with the top face of said expansible and contractible head to limit the downward movement of said internally threaded member, said expansible and contractible head being adapted to grip said internally threaded member to hold same immovable, and means whereby said head is permitted to expand whereby said internally threaded member may be moved relative to said head.

In testimony that I claim the foregoing I hereunto affix my signature.

EMERY E. DAVIS.