No. 643,713. Patented Feb. 20, 1900.

O. E. CONVERSE.

BORING ATTACHMENT FOR METAL WORKING LATHES.

(Application filed June 5, 1899.)

(No Model.) 3 Sheets—Sheet 1.

Fig 1

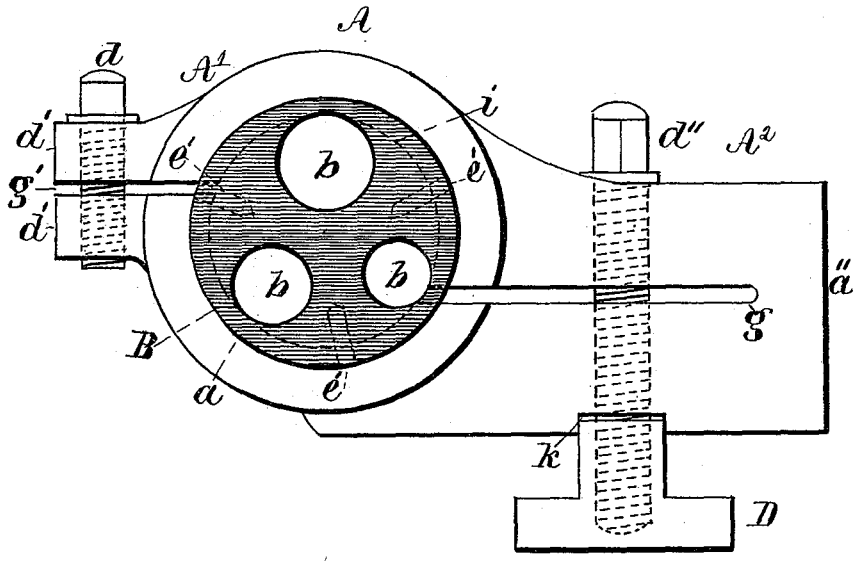

Fig 2

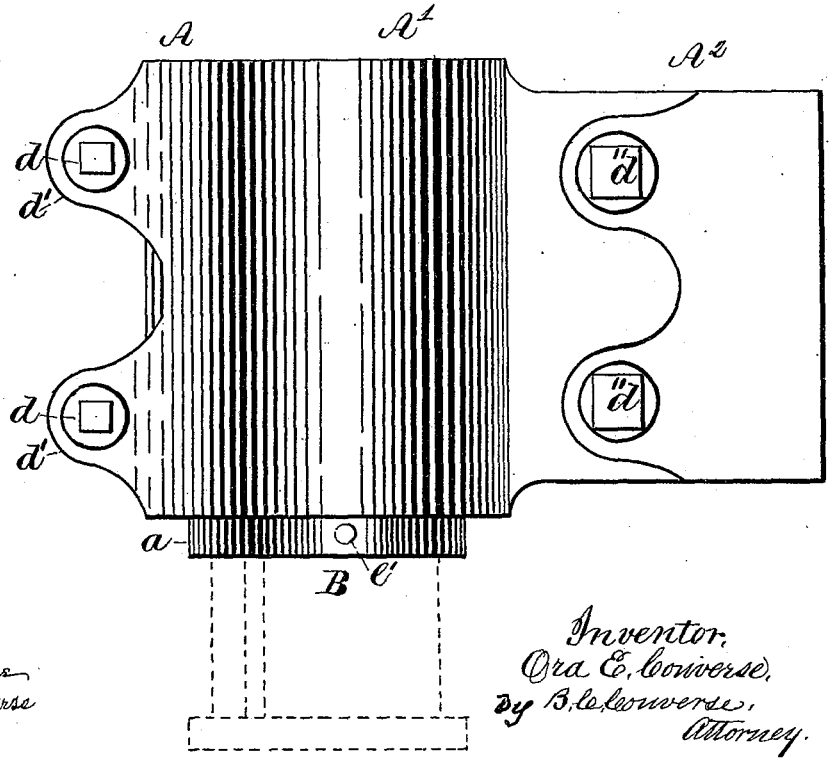

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Fig. 3

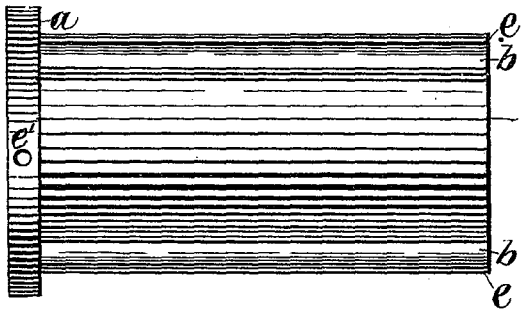

Fig. 4

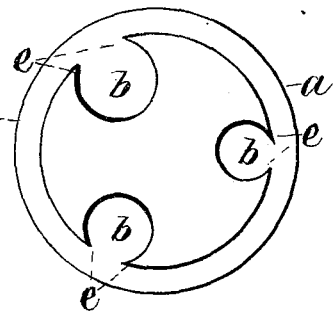

Fig. 6

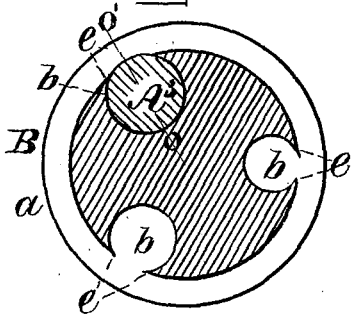

Fig. 5

Fig. 7

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Fig. 8

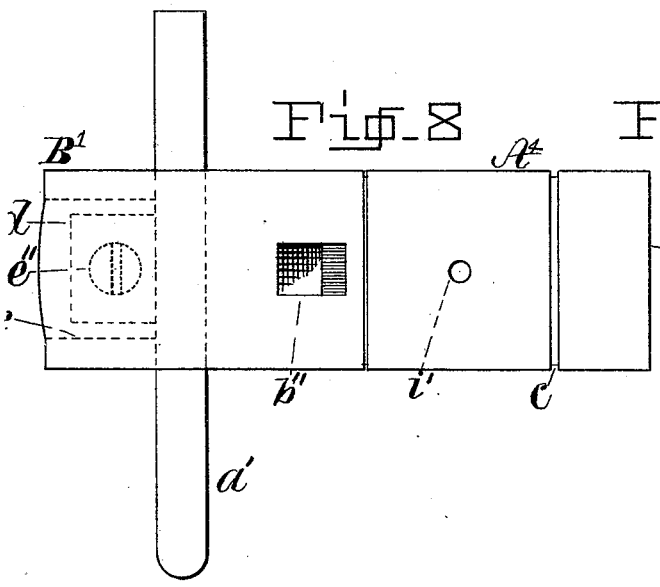


Fig. 9

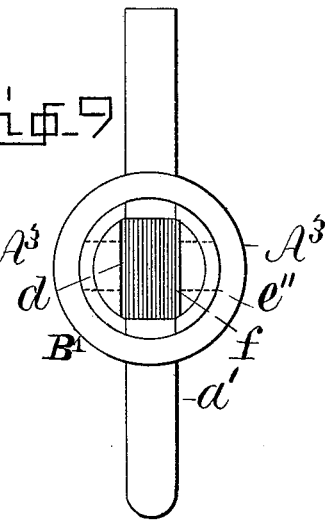


Fig. 10

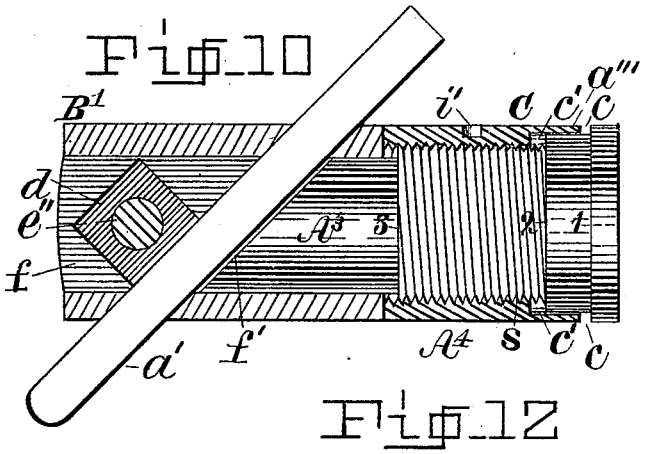


Fig. 11

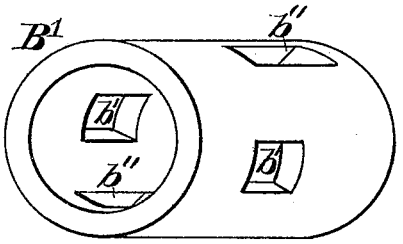
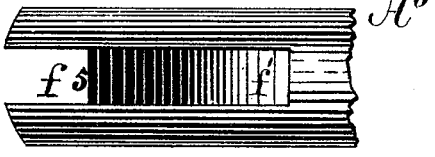


Fig. 12



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UNITED STATES PATENT OFFICE.

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BORING ATTACHMENT FOR METAL-WORKING LATHES.

SPECIFICATION forming part of Letters Patent No. 643,713, dated February 20, 1900.

Application filed June 5, 1899. Serial No. 719,507. (No model.)

To all whom it may concern:

Be it known that I, ORA E. CONVERSE, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Boring Attachments for Metal-Working Lathes, of which the following is a specification.

My invention relates to an improvement in boring attachments for metal lathes; and it combines improvements in both the boring-tool and in the device for holding the latter and for the adjustment of the boring-tool.

The object of my invention is the production of a boring-tool in which the cutter may be set at different angles to the plane of the material upon which it is to operate; also, to provide means for changing the cutter or removing it for grinding or other purpose without removing the boring-bar. The case or holder for clamping the boring-bar is provided with a series of different-sized holes to allow of the use of boring-bars of different sizes. Means are provided for securing the holder to the slide-rest and for the adjustment of the boring-bar without the removal of the latter from the holder.

My improved boring attachment is designed to simplify the operation of changing the cutter from one position to another, as well as to secure it firmly in the boring-bar, so that in cutting a large extent of surface, as in the boring of a cylinder, a continuous cut may be made without change in the surface lines of the material on which it is operating.

Figure 1 is a side elevation of the case of my improved boring attachment. Fig. 2 is a plan view of the same. Fig. 3 is a side elevation of the cylinder in which the boring-bar is inserted. Fig. 4 is an end view of the cylinder shown in Fig. 3, looking from right to left in the latter figure. Fig. 5 is a perspective view of the cylinder with the boring-bar inserted through one of the holes in it. Fig. 6 is a cross-section of the cylinder and boring-bar shown in Fig. 7 through line x, seen in the latter figure. Fig. 7 is a side elevation of the front portion of the cylinder with the boring-bar inserted therein, the cutter being set at a different angle from that of the cutter shown in Fig. 5. Fig. 8 is a side elevation of the boring-bar adapted for use in my improved boring attachment. The view in this figure shows the front section of the boring-bar full size, the latter being cut through in rear of the devices for securing and releasing the cutter. Fig. 9 is a front end elevation of the same. Fig. 10 is a vertical longitudinal section of the boring-tool shown in Fig. 8 with the cutter changed to an angle of forty-five degrees. Fig. 11 is a perspective view of the front sleeve, showing the slotted holes for the cutter. Fig. 12 is a top or plan view of the front end of the boring-bar.

Similar characters of reference indicate similar parts in the several figures.

In the drawings, A is the case of my improved boring attachment. This case consists of the body A′, which incloses the tool-holder, the latter consisting of a cylinder B, which will be hereinafter described. The body A′ is of substantially cylindrical form and has connected therewith the rectangular extension A^2 on the front or operative side of the boring attachment, and on the rear side of the latter lugs d' extend outward from the upper and lower sections of the case A, it being divided by a narrow opening g, extending in a horizontal plane through the middle of the rectangular part A^2 from the bore i, (shown in the dotted circle on the flanged head a of the cylinder B in Fig. 1.) The opening g ends a short distance from the side a'' of the case A, enough metal being left connecting the upper and lower sections of the latter to impart sufficient resilience at this part of the case to cause the sections to spring apart when the compression is removed and resume their normal position again. A similar opening g', (seen on the left of the case A,) extending from the bore i to the left between the lugs d' d' on this side of the case, completes the separation of the upper and lower parts of the body A′. This opening, though not in line with the opening g, is on a plane parallel with that of the latter and is made higher in order to facilitate the adjustment and operation of the boring attachment. Extending through the middle longitudinal line (or near it) of the rectangular part A^2 of the case A are bolts d'' d'',

which pass down into the inverted-T bar D, which secures the boring attachment to the slide-rest of the lathe. A transverse groove *k* (seen in Fig. 1) is cut across the bottom of the section A^2 to receive the top of the T-bar, which is drawn into the groove *k* by the bolts *d'' d''*, thus attaching the case A firmly to the slide-rest of the lathe.

The cylinder B, (shown in the several figures,) which forms the holder for the boring-bar A^3, consists of a solid cast-iron cylinder having a flanged head *a* on the inner end. This flange prevents the cylinder from being pushed out of the case A when it may not be properly clamped. It also prevents dust or cuttings of metal from getting into the bore *i* of the case A, so as to interfere with the rotation of the cylinder B in making the adjustment of the boring-bar.

The cylinder B has a series of holes *b b b* graded to suit different-sized boring-bars. The holes *b b b* are bored longitudinally so near the exterior of the cylinder as to cut through the surface of the latter, leaving a space *e*, as seen in Figs. 3, 4, 5, and 6, extending from the flanged head *a* to the opposite end of the cylinder over each of the holes *b b b*. In the construction of the cylinder B the object of dividing the outer wall of the holes is easily understood by referring to the figures named, which show the projection of the body of the boring-bar A^3 as appearing above the surface of the cylinder B through the space *e*.

The flanged head *a* of the cylinder B is provided with holes *e'* in its periphery for the use of a spanner or a rod to rotate the cylinder for bringing the boring-tool to the desired point for operating upon the work and for its adjustment.

In the construction of the boring-tool for my improved boring attachment the cylindrical bar is first turned down from the point 1 on the boring-bar A^3, Fig. 10, forward to point 2, with a smooth surface, and a shoulder of about one-sixteenth of an inch left at the point 1. From point 2 forward to the point 3 the bar is still further reduced about the same depth and a screw-thread S cut on the part between the points 2 and 3, as seen in the figure. A screw-threaded sleeve A^4 fits over this part of the boring-bar, its interior thread engaging the thread S on the bar. The rear end of the sleeve A^4 is turned out about one-half its thickness to a depth equal to the length of the smooth-surfaced part C, and this thin part *a'''* of the sleeve A^4 slides over the part C. The bar A^3 from the front end of the thread S to its extreme front end is reduced to about two-thirds its normal size. It is slightly rounded off at the end and an open slot cut diametrically through it, as seen at *f*, Fig. 12, removing about one-third of the thickness of the bar A^3 through the axial line of the latter at this point. The opening *f* is formed with parallel sides and extends back to the point 5, as seen in Fig. 12, and from this point the lower wall *f'* of the slot extends upward and backward at an angle of forty-five degrees from the bottom line of the bar A^3 to the top of the latter. Within the opening *f* of the bar A^3 is a centrally-pivoted rectangular block *d* upon a screw-bolt *e''*. This block has a rotative adjustment upon the pin *e''*, so that any one of its face sides can be adjusted to the line of the cutter *a'* inserted in the boring-bar A^3, either in the position shown in Figs. 8 and 9, where it is seen at right angles to the axis of the boring-bar A^3, or as seen in the view Fig. 10, where the cutter *a'* is shown at an angle of forty-five degrees. From the point 3 to the front end of the bar A^3 it is finished with a smooth surface equidistant throughout from its axial line, and a heavy sleeve B' slips over this part of the boring-bar and is easily rotated upon the latter when the cutter *a'* is removed. This sleeve is shown in Figs. 8, 9, 10, and 11. In the latter figure sleeve B' is shown in perspective, the diametrically opposite slot-holes *b'* being made in the sleeve for the insertion of the cutter *a'* through the sleeve B' and the opening *f* in the boring-bar A^3 at right angles to the line of the latter, as shown in Figs. 8 and 9, and the inclined slot-holes *b''* are made for the insertion of the cutter *a'* at an angle of forty-five degrees through the sleeve B' and bar A^3 along the line of the inclined bottom wall *f'* of the slot *f*, as shown in Figs. 10, 11, and 12. By reference to the several figures it will be seen that the sleeves A^4 and B' are of the same external diameter as the body of the boring-bar A^3, so that there are no projecting parts to interfere with the free operation of the boring-tool. After the sleeve A^4 is slipped upon the boring-bar A^3 and screwed back into its place upon the threaded part S of the latter the thin part *a'''* extends over the part C and excludes the metal dust and cuttings from the threaded parts. The sleeve B' is then slipped onto the front end over the block *d* and pushed back until its rear end abuts the front end of the section A^4. It is now rotated to bring the set of holes *b'* or *b''* in line with the slot *f* in the end of the boring-bar A^3, and the cutter *a'* is inserted. The section A^4 is now screwed forward upon the threaded part S against the rear end of the sleeve B', and the cutter is clamped firmly between the rear wall of the slotted holes *b'* or *b''*, through which the cutter *a'* may be inserted, and the abutting surface of the block *d* in front of the latter. When it is necessary to remove the cutter *a'* for any purpose, it is released by simply reversing the movement of the sleeve A^4, a hole *i'* being provided in the latter for the introduction of the nipple of a spanner or a pin for rotating it. In Fig. 10 the spaces *c* and *c'* at the rear end of the sleeve A^4 show the extent of movement of the latter.

I claim as my invention—

1. In a boring attachment for metal-working lathes, the case A, having the bore *i*; the parallel openings *g*, *g'*, extending from either

side of said bore *i*, dividing said case A, and terminating upon one side, within the latter; the rotatable and adjustable cylinder B, loosely fitted in said bore, having the perforated flange *a*, and provided, parallel to its axis, with a series of holes *b*, *b*, *b*, differing in size, and intersecting the periphery of said cylinder, in combination with the boring-bar A^3, having the removable cutter *a'*; the devices for changing said cutter from one angle to another, and for securing it in said boring-bar; means for clamping said cylinder and said boring-bar, and for attaching said case A, to the slide-rest of a lathe, substantially as described.

2. In a boring attachment for metal-working lathes, the combination with the case A, having a longitudinal bore *i*; the transverse parallel openings *g*, *g'*, extending from said bore, and terminating, on one side, within the exterior wall of said case; the rotatable and adjustable cylinder B, loosely fitted in said bore *i*, and provided, parallel to its axis, with holes *b*, *b*, *b*, variable in size, and cutting the peripheral wall of said cylinder; the openings *e*, *e*, in said cut walls; the boring-bar A^3, having the removable cutter *a'*; means for changing said cutter from one angle to another, and for fastening it in said boring-bar; means for clamping said cylinder B, in said case A, and for attaching the latter to the slide-rest of a lathe, substantially as hereinbefore specified.

3. In a boring attachment for metal-working lathes, the case A, composed of the cylindrical body A', and the rectangular extension A^2; the parallel openings *g*, *g'*, dividing said body A', and said extension A^2, and terminating within the latter; the bore *i*, in said body A', of said case A; the rotatable and adjustable cylinder B, having the flange *a*, perforated with holes *e'*; said cylinder being provided with holes *b*, *b*, *b*, parallel to its axis, and intersecting its periphery; the openings *e*, *e*, in the latter, over said holes *b*, *b*, *b*, and extending from the flange *a*, to the opposite end of said cylinder; the boring-bar A^3; means for clamping said cylinder and said boring-bar in said case A; and means for attaching the latter to the slide-rest of a lathe substantially as hereinbefore specified.

4. In a boring attachment for metal-working lathes, the boring-bar A^3, having the removable cutter *a'*; the devices for changing said cutter from an angle of forty-five to ninety degrees, and vice versa, and for fastening said cutter *a'*, in said boring-bar A^3; the divided case A, having the bore *i*; the rotatable and adjustable cylinder B, loosely fitted in the latter, and having a perforated flange *a*; said cylinder being provided, parallel to its axis with holes *b*, *b*, *b*, cutting the periphery of said cylinder, and forming the openings *e*, *e*, in the latter; means for clamping said boring-bar and said cylinder in said case A; and means for attaching the latter to the slide-rest of a lathe; substantially as described.

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

ORA E. CONVERSE.

Witnesses:
AMOS WOLFE,
M. D. CONSIDINE.