(No Model.)

C. E. BILLINGS.

CUTTING-OFF TOOL.

No. 318,687. Patented May 26, 1885.

Fig. 1

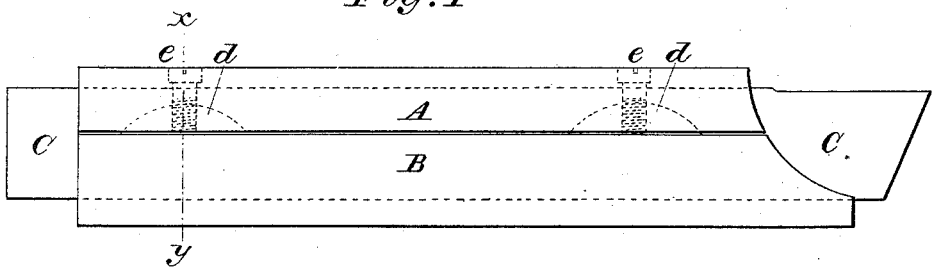


Fig. 2

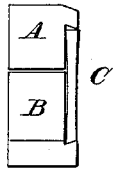


Fig. 3

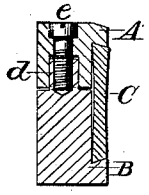


Fig. 5

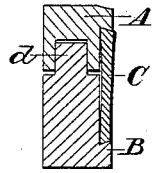
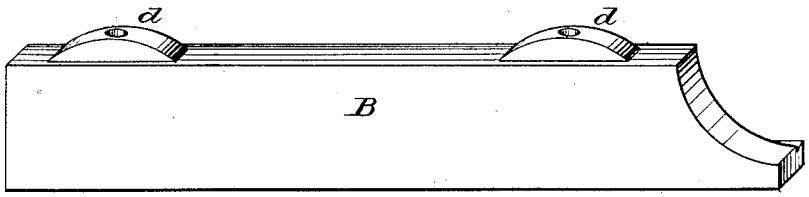


Fig. 4



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UNITED STATES PATENT OFFICE.

CHARLES E. BILLINGS, OF HARTFORD, CONNECTICUT.

CUTTING-OFF TOOL.

SPECIFICATION forming part of Letters Patent No. 318,687, dated May 26, 1885.

Application filed December 11, 1884. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. BILLINGS, of the city and county of Hartford, and State of Connecticut, have invented certain new and useful Improvements in Cutting-Off Tools, of which the following is a full, clear, and exact description, whereby a person skilled in the art can make and use the same, reference being had to the accompanying drawings.

My invention relates to that class of cutting-off tools which are used in metal-working lathes for the purpose of cutting off bars by turning therein a deep and narrow groove. The old way of making a tool of this class was to forge it from a single piece of bar steel, making one end of the same thin for cutting and the rest larger for rigidity and for convenient insertion in the tool-post of the lathe. Thus the holder and cutter were both in one piece. The frequent dressing down of the tool, rendered necessary by this construction, was inconvenient and expensive. Afterward tools of this class were made of two separate or separable parts—viz., a holder for insertion in the tool-post and a cutting-plate for insertion in the holder. The holder has also been made in two separable parts, as in the case of the holder for which Letters Patent of the United States No. 292,784, were issued to me February 5, 1884.

Experiment has disclosed the fact that in the case of a tool-holder constructed as described in said Letters Patent the lower segment is practically the weakest part, and is liable to give way in that part which is pierced by the screws which keep the two segments of the holder together, and especially in that part which is pierced by the screw which is near the forward end of the holder. This part, therefore, requires to be strengthened. The object of the present invention is to impart additional strength to that part of the holder which is subjected to the greatest strain, and at the same time to preserve an external configuration of the holder convenient for insertion in and withdrawal from the tool-post, and to accomplish these results without increasing the size of the holder. These objects I accomplish by the mechanism illustrated in the drawings, in which like letters of reference denote like parts.

Figure 1 is a side view of my improved holder with cutting-off tool in position therein. Fig. 2 is a front end view of the same. Fig. 3 is a cross-section of the same through the line *x y* in Fig. 1. Fig. 4 is a perspective view of the lower segment of the holder; and Fig. 5 is a cross-section of my improved holder in a modified form with cutter in position.

A, the upper segment of the holder, consists of a strip of metal of the general form shown in the drawings, having one vertical plane side, a top plane side, which is slightly beveled at one edge, a bottom plane side, and a fourth side of irregular form, hereinafter described. The ends of A may be cut off square. The bottom side of A is pierced by two holes or concavities, which are of proper size, shape, and position to contain and fit closely over the lugs *d d*, hereinafter mentioned, when the two segments are brought together.

B, the lower segment of the holder, consists of a strip of metal, preferably somewhat larger and stronger than A, and has one vertical plane side, two horizontal plane sides, the upper side being relieved by the lugs *d d*, hereinafter described, and a fourth side of irregular form, hereinafter explained. The lugs *d d* are raised portions of the segment B, projecting therefrom, and may conveniently be made in the form shown in Figs. 1, 3, and 4. The lugs *d d* are narrower than the body of the segment B, and are located midway of the thickness of B, one of the same being near each end of this segment. The whole segment B, including the lugs *d d*, is formed of one and the same piece of metal.

A and B, when placed in juxtaposition or contact with each other in the position indicated in Figs. 1, 2, and 3, with their vertical sides in the same plane and their horizontal sides consequently in parallel planes, constitute the holder A B for the cutter C. This holder is made of proper size for insertion in the tool-post of the lathe, and is channeled out on one side so as to present a broad but shallow recess of the general form shown in Figs. 1, 2, 3, and 5. This channel or recess extends the entire length of the holder, lies partly in A and partly in B, and is beveled internally at each side of said channel to receive and retain the cutter C, which

can slide lengthwise therein; hence the irregular form of the fourth sides of A and B, above mentioned.

The segments A and B of the holder A B are held in their desired relative positions of juxtaposition or of contact, above described, as the case may be, by the screws *e e*, which are threaded only at and near the entering end, are countersunk in A, and are provided with shoulders, so that the segments may be drawn together by turning up the screws, and may be loosened and suffered to separate a little from each other by unscrewing *e e*. The segment A and the lugs *d d* upon the segment B are provided with proper screw-holes for *e e*, which screw-holes are threaded internally in *d d*, and are provided with shoulders in A, adapted to engage the before-mentioned shoulders of *e e*, as shown in Figs. 1, 3, and 4. The screw-holes in *d d* are not deep enough to penetrate the main body of the segment B, and hence the entering end of the screws *e e* is always within the lugs *d d*. The lower segment, B, extends a little farther forward longitudinally than the upper segment, A, so as to give a firm support for the lower edge of the cutter C. The segments A and B, with the screws *e e* and lugs *d d*, constitute the complete holder.

Instead of separate lugs *d d* and holes in A to contain the same, I have made the raised parts of B continuous in the form of a simple tongue extending from end to end of the lower segment, and have made the hollowed-out parts of A continuous in the form of a uniform channel extending from end to end of the upper segment of the holder, all which is shown at Fig. 5, which is a view of such modified construction of the holder in cross-section, taken at an indifferent point; but I prefer the construction first stated.

The slight bevel along the upper edge of A directly over the cutter, as seen in Figs. 2, 3, and 5, relieves the channeled part of the holder from undue pressure in the tool-post.

C is the cutting-plate or cutter proper, and is formed of a thin strip of steel beveled at its upper and lower edges, as shown in Figs. 2, 3, and 5, and is dovetailed into the channel in the holder A B. In grinding the cutter the bevel will be removed from the upper edge of C near the cutting-point or acute angle of C, as shown in Figs. 1 and 2.

The present invention possesses an advantage over that patented to me as above, consisting in the fact that the lugs *d d* diminish the lateral strain upon the screws, so that smaller and shorter screws are sufficient, and hence the main body of the segment B, instead of being weakened by screw-holes as in that case, is here strengthened by the lugs *d d*, while the tool-holder remains of the same size and external form as before.

Such being the construction of my invention, the mode of its operation is as follows: The screws *e e* being somewhat loosened in A by partial unscrewing, the blade or cutter C is inserted in its holder A B in the position indicated in the drawings. The screws are then turned in until the cutter C is clasped or clamped somewhat firmly between A and B in the same position. The tool is then inserted in the tool-post of the lathe. The set-screw of the latter is then turned down upon A, binding the segments A and B together, and at the same time clamping the holder upon the cutter with all necessary additional firmness. When so clamped, the tool is ready for use in the ordinary manner of using cutting-off tools.

The form of the holder A B, which presents a general rectangular cross-section, and is destitute of projecting screw heads, nuts, &c., allows the holder to be inserted in the tool-post from behind, and renders it unnecessary to turn the tool-post around in order to insert or withdraw the tool; also, the cutter may be reversed and placed in the holder end for end, whereby the instrument is adapted to be used in a planer. The above construction also provides a convenient holder, A B, for the cutter C, to hold the latter while being ground, for which purpose it is only necessary to tighten the screws *e e*, as above described. Indeed, the function of the screws *e e* is to hold the parts of the combined tool-holder and tool together when the same is not in use and during the process of grinding the cutter C. These screws have no function to perform while the cutter is being used. The free motion of the stock-segment A upon the lugs *d d* when the screws *e e* are loosened or screwed up, as above described, allows cutters of slightly-different sizes to be used successively in one and the same holder A B.

I claim as my invention—

1. The combination of the cutter plate or blade C with the stock or holder A B, consisting of the two segments A and B, connected together by the lugs *d d*, substantially as and for the purpose specified.

2. The combination of the cutter C with a holder consisting of two segments, A and B, which are connected by the lugs *d d* and screws *e e*, substantially as described, and for the purpose specified.

3. An improved tool-holder, consisting of two separable segments, A and B, provided with lugs *d d* and screws *e e*, for holding said segments in their proper relative positions of contact or juxtaposition, as the case may be, said screws having their heads countersunk in A, and their points within the lugs *d d*, in combination with the blade or cutter-plate C, all constituting a combined cutting-off tool and holder thereof having a uniform cross-section and a convenient external form for insertion in and withdrawal from the tool-post of a lathe.

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