No. 870,301. PATENTED NOV. 5, 1907.

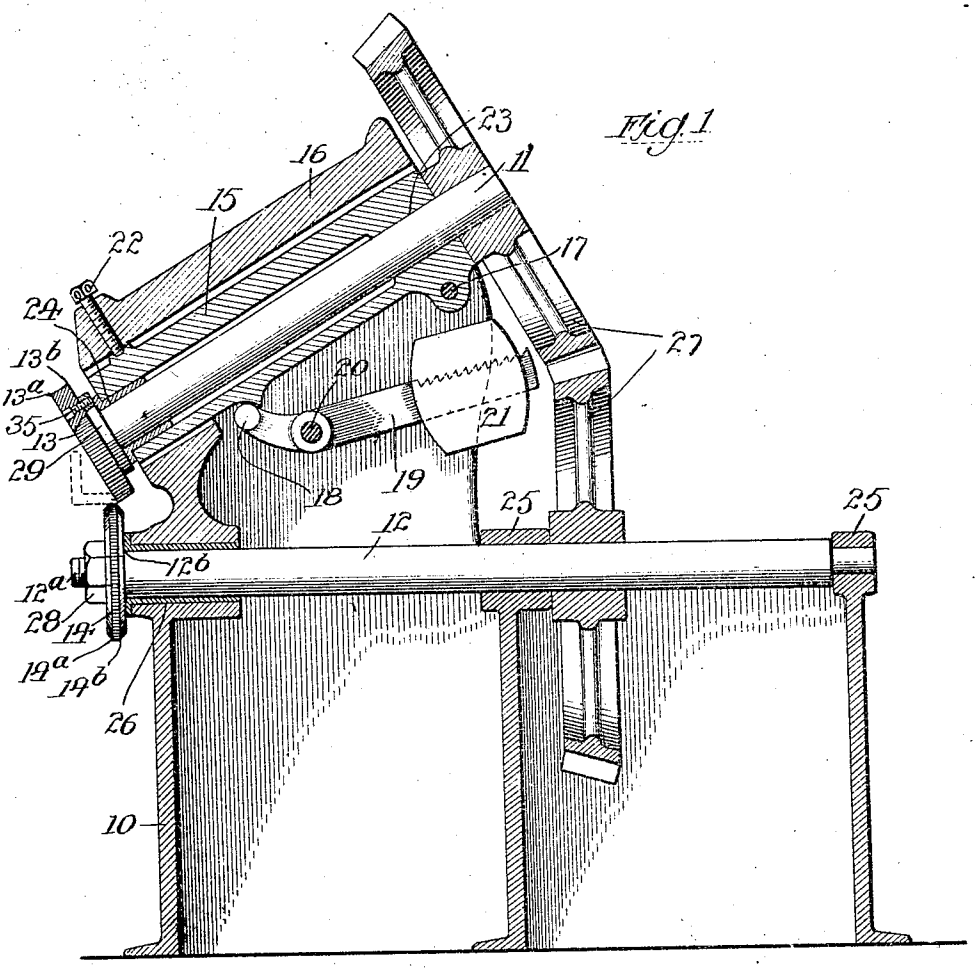
C. E. LINGENFELTER.

BEVELING MACHINE.

APPLICATION FILED AUG. 22, 1904.

2 SHEETS—SHEET 1.

Fig. 1



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2 SHEETS—SHEET 2.

Fig. 2.

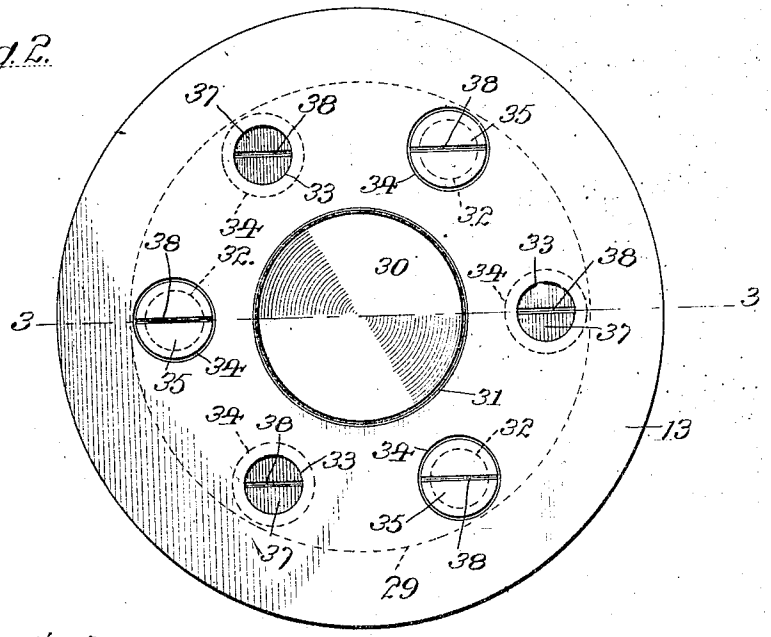
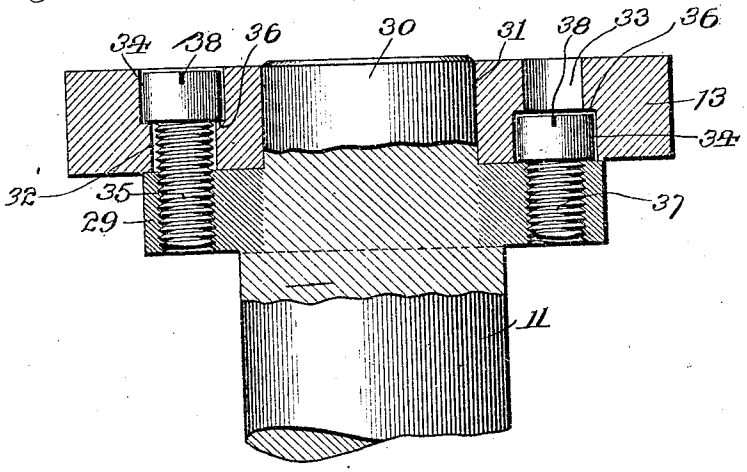


Fig. 3.



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UNITED STATES PATENT OFFICE.

CARL E. LINGENFELTER, OF CHICAGO, ILLINOIS, ASSIGNOR TO SCULLY STEEL & IRON COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION.

BEVELING-MACHINE.

No. 870,301. Specification of Letters Patent. Patented Nov. 5, 1907.

Application filed August 22, 1904. Serial No. 221,683.

To all whom it may concern:

Be it known that I, CARL E. LINGENFELTER, a citizen of the United States, and a resident of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Beveling-Machines, of which the following is declared to be a full, clear, and exact description.

The invention relates to shearing machines for beveling the edges of metal plates, bars and the like and in particular to the means for securing the beveling cutter to its shaft.

The coöperating cutters of shears for beveling the edges of metal plates, bars and the like are usually mounted upon projecting ends of their operating shafts, which shafts have reduced portions extending through the cutters and heavy nuts threaded upon the ends of the reduced portions engage the outer faces of the cutters and hold them securely in position. Such cutters are usually provided with cutting edges on both faces and the nuts hold the cutters reversibly in place so that either cutting edge may be brought into play. The ends of the shafts and nuts however, project beyond the outer faces of the cutters in such a manner that angle-bars, particularly those of small dimension, cannot be properly beveled upon the machine.

The object of the present invention is to provide peculiar means for securing one of the cutters to its shaft so arranged that neither the shaft nor the fastening means project beyond the outer face of the cutter, whereby angle-bars may be suitably beveled with the machine.

The invention consists in the features of construction hereinafter set forth, illustrated in the accompanying drawings and more particularly pointed out in the appended claims.

In the drawings: Figure 1 is a vertical section of the beveling machine to which the present improvement is applied. Fig. 2 is an end view of the upper cutter shaft and fastening means therefor. Fig. 3 is a section on line 3—3 of Fig. 2.

The frame 10 of the machine may be of any suitable construction, but should be of considerable weight as the machine is subjected to great strain. Upper and lower cutter shafts 11 and 12 are journaled upon the machine and carry the coöperating upper and lower cutters 13 and 14. The upper cutter shaft is preferably inclined in position and journaled in a sleeve 15 which is carried within an upwardly projecting portion 16 of the frame 10. Sleeve 15 is pivotally mounted at its inner end upon a cross bolt 17 and its outer end rests upon a lug 18 which is carried on a lever 19. Lever 19 is pivoted between its ends upon a cross bolt 20 and its rear end is provided with an adjustable counterweight 21, by which the outer end of the sleeve 15 and counter-shaft 11 are pressed upwardly against an adjusting bolt 22, threaded through the outer end of the frame portion 16. By adjusting the bolt 22 the cutters 13 and 14 may be brought into proper coöperative relation.

Sleeve 15 is provided with an inner bearing portion 23 and an outer bearing 24 for the upper cutter shaft 11. The frame 10 is provided with bearings 25 for the inner end of the lower shaft 12 and with an outer bearing 26 for the outer end of the shaft. The cutter shafts project beyond the outer bearings 24 and 26 and carry the cutters 13 and 14 clear of the frame and outside of the bearings so that the work may be properly presented thereto. The cutters upon the shafts engage the outer shaft bearings 24 and 26. The rotary shearing cutters 13 and 14 are disk-shape as shown, and as they are subjected to considerable strain are necessarily quite thick. Each of the cutters is provided with two cutting edges on opposite sides thereof 13^a, 13^b and 14^b, 14^a. These cutting edges are formed by grinding and milling the edge portions of the disk-shape cutters. These edge portions are arranged at an angle to each other and for this purpose the lower shaft is preferably arranged in horizontal position as shown, and the upper shaft inclined at the proper angle thereto. The edge portion of the lowermost cutter engages the under face of the work as indicated in Fig. 1, and supports the edge as it is beveled. The outer cutting edge 13^a of the upper cutter coöperates with the inner cutting edge 14^b of the lower cutter to chamfer or bevel off the edge of the work, the greater part of the cutting being done by the inclined upper cutter. The cutter shafts in the form shown, are provided at their inner ends with inter-meshing gears 27 and the power may be applied to the lower shaft 12 in any suitable manner. The outer end of the lower cutter shaft 12 is provided with a reduced portion 12^a forming a shoulder 12^b in line with the outer face of the bearing 26. The cutter is held against the shouldered portion 12^b by a large nut 28 threaded upon the reduced portion 12^a and engaging the outer faces of the cutter. By this means the lower cutter 14 is removably held in position and may be reversed when one cutting edge is worn or nicked, to bring the other cutting edge into play. Heretofore the upper beveling cutter 13 has been mounted in a similar manner, but the projecting end of the shaft and the nut mounted thereon, are necessarily large and heavy and project beyond the outer face of the cutter and beyond the cutting edge thereof so that the edges of angle-bars, except those of very large size, could not be properly beveled, since the portion of the angle-bars not operated upon would strike against the projecting end of the upper shaft or the nut thereon.

The present improved means for securing the upper

cutter in the shaft is shown in detail in Figs. 2 and 3. The outer end of the upper shaft 11 is provided with a large shouldered portion preferably in the form of a collar 29 which may be constructed in one piece with the shaft, but which is preferably welded upon a reduced end portion 30 of the shaft, as indicated in Fig. 3. The cutter 13 is provided with a central opening 31 within which the reduced end portion 30 of the shaft snugly fits with the cutter abutting against the outer face of the collar 29. This outer face of the collar is so spaced from the end of the shaft, that the latter is substantially in the same plane with the outer face of the cutter, and does not project to any material extent beyond the same.

The cutter is provided with a circular series of bolt-holes 32 and 33 arranged intermediate the center opening 31 and its outer cutting edge. These holes are six in number in the form shown, and are spaced apart at regular intervals. These bolt-holes are alternately enlarged or countersunk in opposite faces of the cutter. That is to say, the bolt-holes 32 are provided with countersinks 34 on one side of the cutter, while the bolt-holes 33 intermediate the holes 32 are provided with countersinks 34 in the opposite face of the cutter. A series of screw-bolts 35 extend loosely through the bolt-holes 32 in the cutter and are threaded into correspondingly arranged openings in the collar 29. The heads of the bolts set entirely within the countersinks 34 in the outer face of the cutter and rest upon a shoulder 36 formed by the enlarged or countersunk portion of the bolt-hole. A series of shorter bolts 37 are threaded into the collar 29 with their heads engaging the outer face thereof and fitting within the countersinks 34 on the inner face of the cutter. The bolts 35 serve to securely hold the cutter upon the end of the cutter-shaft 11. While the shorter bolts 37 do not assist in holding the cutter against end-wise movement, they cooperate with the bolts 35 to take the circumferential thrust upon the cutter, which of course is the direction in which the greatest strain is exerted. The heads of the bolts 35 and 37 and the corresponding countersinks 34 within which they fit, are preferably of considerable width and cylindrical in form, as shown.

The bolt-holes 32 and 33, which are countersunk on opposite faces of the cutter, are correspondingly arranged so that by removing the bolts 35 the cutter may be removed and reversibly secured on the shaft in reversed position and either cutting edge 13^a or 13^b may be brought into operative position. The cutters in this beveling machine are necessarily large and heavy and of hardened steel so that the expense of grinding and rehardening is considerable. The construction is also such that in grinding, two cutting edges are necessarily formed so that it is of considerable importance that the cutter should be reversibly held in position. This is effected by the present improved fastening devices and neither the shaft nor the fastening means project beyond the outer face of the inclined cutter 13 so that, as indicated in dotted lines in Fig. 1, the edges of angle-bars of any size may be properly beveled. At the same time, the cutter is rigidly and securely held upon the end of its shaft and the strain thereon properly taken up. The bolts 35 and 37 are of such length that they do not project beyond the inner face of the collar 29 which bears directly upon the bearing 24. The heads of bolts 35 and 37 are provided with cross slots 38 to receive a suitable tool by which they may be removed from and placed in position.

It is obvious that the details of construction may be changed without departure from the essentials of the invention.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. The combination with the cutter shaft, of a reversible cutter having cutting edges upon its opposite faces, mounted upon the end of said shaft with its outer face substantially in the plane with the end face of the shaft, a shoulder on said shaft adjacent its end, and bolts removably securing said cutter to said shoulder, the bolt-holes in said cutter being countersunk upon opposite faces of said cutter to receive the heads of said bolts.

2. The combination with the cutter shaft, of a reversible cutter mounted upon the outer projecting end of said shaft having cutting edges upon its opposite faces, a shouldered portion on said shaft adjacent its end, a series of bolt holes in said cutter and bolts extending through said holes and securing said cutter to said shouldered portion, some of said bolt-holes being countersunk on one face of said cutter and the others upon the opposite face thereof to receive the heads of said bolts, the countersinks in the opposite faces being correspondingly arranged.

3. The combination with the cutter shaft, of a reversible cutter mounted upon the outer projecting end of said shaft having cutting edges upon its opposite faces, a shouldered portion on said shaft adjacent its end, a circular series of bolt-holes in said cutter alternately countersunk in opposite faces thereof, a collar on said shaft adjacent its end and screw bolts threaded into said collar with their heads arranged within the countersinks in the opposite faces of said cutter.

4. In beveling machines, the combination with the frame, of shaft bearings, upper and lower cutter shafts projecting beyond the outer shaft-bearings, reversible cutters mounted upon the outer projecting ends of said shaft adjacent said outer bearings, said shafts having cutting edges upon opposite faces thereof, the outer face of the upper cutter being in substantially the same plane with the end of said upper shaft, a collar on said upper shaft adjacent its end, and a series of bolts securing said shaft to said collar, part of the bolt-holes on said cutter being countersunk in one face thereof and part in the opposite face to receive the heads of said bolts, the countersinks in the opposite faces being correspondingly arranged.

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