Jan. 19, 1926. 1,570,042

S. B. CLAY

FACING TOOL FOR GASKET SEATS

Filed Nov. 19, 1923

Fig. 1.

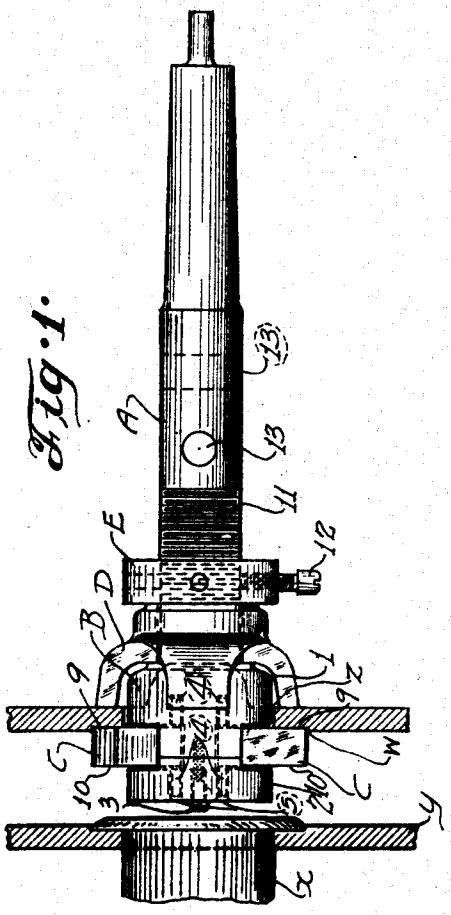


Fig. 2.

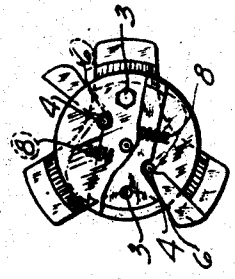


Fig. 3.

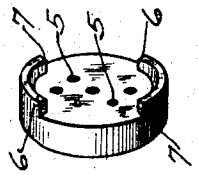
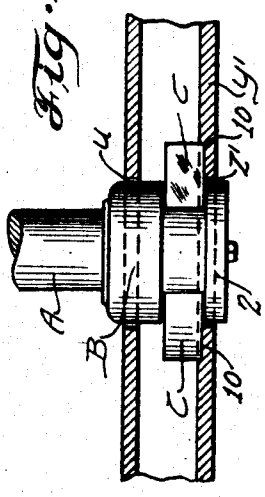


Fig. 4.



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UNITED STATES PATENT OFFICE.

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FACING TOOL FOR GASKET SEATS.

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To all whom it may concern:

Be it known that I, SAMUEL B. CLAY, a citizen of the United States, residing at St. Louis, Missouri, hve invented a certain new and useful Improvement in Facing Tools for Gasket Seats, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to cutting tools of the kind that are used for forming a circular, flat surface on a member surrounding a hole in the member.

The main object of my invention is to provide an efficient tool of simple design for forming or facing off the hand hole cover gasket seats or tube seats on the inner side of a header or water box of a water tube boiler.

Another object is to provide a tool of the kind referred to which is of such design that it can be inserted in a boiler header or water box through a hand hole in the front side of same and thereafter operated manually by a workman located on the outside of the boiler to face off or dress down the gasket seat surrounding the hole through which the tool is inserted. Other objects and desirable features of my invention will be hereinafter pointed out.

Figure 1 of the drawings is a view illustrating the method of using my improved tool in the field to face off or dress down the hand hole cover gasket seats on the inner side of a header or water box to which boiler tubes are connected.

Figure 2 is an end view of said tool, partly broken away, to show how the cutters are pivotally mounted in the head of the tool.

Figure 3 is a perspective view of the end piece of the head of the tool; and

Figure 4 is a view, illustrating the method of using my improved tool in the factory to form hand hole cover gasket seats or tube seats on the inner side of a sectional boiler header.

Referring to the drawings which illustrate the preferred form of my invention, A designates the shank of my improved tool, B designates a head carried by said shank and C designates cutters pivotally mounted in said head in such a way that rotary movement of the head in one direction causes the cutters to swing outwardly into a position where the outer end portions of same project radially beyond the periphery of the head, and rotary movement of said head in the opposite direction causes the cutters to swing inwardly into a position where the outer end portions of same are housed within the head. The head B of the tool is of substantially the same diameter as the hand holes in the front wall of a sectional boiler header or water box so as to enable said head to be inserted through a hand hole when the cutters C are collapsed or housed within the head. After the head of the tool has been inserted in the hand hole the shank A of the tool is rotated in a direction to expand the cutters or cause them to swing outwardly into such a position that the cutting edges of same will act on the inner side of the hollow member into which the head of the tool projects. Thereafter, when the shank of the tool is rotated in the opposite direction, the cutters C will collapse, thus permitting the head of the tool to be withdrawn from said hollow member.

The head B can be constructed in various ways without departing from the spirit of my invention as expressed by the scope of the claims and said head can be provided with any desired number of cutters. In the tool herein shown the head B is composed of a stationary part 1 carried by the shank A of the tool, and a removable end piece 2 that is retained in position by a plurality of fastening devices 3 extending through the end piece 2 and screwed into the stationary part 1 of the head. The end piece 2 and stationary part 1 are cut away so as to form a pocket or space in the head in which the cutters C are arranged in such a manner that the outer end portions of said cutters can move inwardly and outwardly with respect to the outer surface or periphery of the head B of the tool. Preferably, the inner ends of the cutters C are pivotally mounted on pins 4 that project into holes 5 formed in the stationary part 1 and end piece 2 of the head. The outward movement of said cutters is limited by shoulders 6 on the head against which the rear sides of the cutters C bear, during the cutting operation, and the inward movement of said cutters is limited by shoulders 7 on the head against which the front sides

of said cutters strike when the head is revolved in a direction to collapse the cutters or cause them to swing inwardly into the position shown in broken lines in Figure 2. If desired, the head B of the tool can be provided with resilient buffers 8 mounted in the head in such a way that they will bear against the front sides of the cutters C when said cutters are retracted or collapsed, and thus tend to throw the cutters outwardly as soon as the head is revolved in a direction to expand the cutters. Each of the cutters C is provided with two parallel cutting edges 9 and 10 disposed at substantially right angles to the longitudinal axis of the shank A of the tool.

When the tool is to be used in the field to dress down or face off the hand hole cover gasket seats of a boiler the cutting edges 9 of the cutters C are used, and when the tool is used in the factory to form, dress down or face off the hand hole cover gasket seats or tube seats on the inner side of a sectional header, before said header is combined with the water tubes of a boiler, the cutting edges 10 of the cutters are used. In Figure 1 of the drawings I have illustrated the method of using the tool in the field, the reference character *x* designating the tubes of a boiler, the reference character *y* designating a header or water box to which said tubes are connected, the reference character *z* designating one of the hand holes in the front side of said header or water box and the reference character *w* designating a hand hole cover gasket seat on the inner side of said wall surrounding the hand hole *z*. To face off or dress down said hand hole cover gasket seat *w*, the operator inserts the head B of the tool through the hand hole *z* and then turns the head of the tool in a direction to cause the cutters C to swing outwardly into their extended position, as shown in Figure 1. Thereafter the operator moves a yoke-shaped bearing member D loosely mounted on the shank A of the tool longitudinally of the shank into engagement with the front side of the wall in which the hand hole *z* is formed, thus causing the cutting edges 9 of the cutters C to be drawn into engagement with the hand hole cover gasket seat *w* on the inner side of said wall. A collar E that is rotatably mounted on a screw-threaded portion 11 on the shank A of the cutter is then turned in a direction to cause it to engage the bearing member and retain said bearing member and the cutters C in engagement with the front wall of the hollow member into which the head of the tool projects, said collar E being retained in adjusted position by tightening a set screw 12 on said collar. Thereafter the shank A of the tool is revolved in a direction to cause the cutting edges 9 of the cutters to act on the gasket seat *w* and dress down or face off said seat, the shank A of the tool being provided with a plurality of right-angularly-disposed holes 13 in which the operator can insert a bar or the like to facilitate the turning of the shank A. During the cutting operation it is necessary to rotate the collar E at intervals as the surface of the gasket seat *w* is cut away by the cutters so as to feed the cutters into the work. At the completion of the cutting operation the shank A of the tool is revolved in the opposite direction so as to retract the cutters and thus enable the head of the tool to be withdrawn from the hand hole.

When the tool is being used in the shop to form the hand hole cover gasket seats on the inner side of a sectional boiler header *y'*, the head B of the tool is inserted through one of the tube holes *u* in the rear wall of the header and moved downwardly so as to cause the cutting edges 10 of the cutters C to bear against the inner surface of the front wall of said header and form a gasket seat in said surface surrounding the hand hole *z'* in the front wall of the header when the shank A of the tool is rotated in one direction, said shank being connected to the spindle of a drill or other machine for mechanically operating the tool. After the hand hole cover gasket seats have been formed the header is turned upside-down so as to enable the tool to be used for forming seats in the inner surface of the rear wall of the header for receiving the flanged ends of the boiler tubes. When the tool is being used in this way it is not necessary to use the bearing member D or collar E, due, of course, to the fact that the boiler header on which the tool is operating is sustained by a work rest or support and the shank of the tool is connected to a drill spindle or the like which is actuated to feed the cutters into the work.

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

1. A tool for the purpose described, comprising a shank, a head on said shank that is adapted to be inserted through a hand hole or tube hole in a boiler header or water box, a plurality of pivotally mounted cutters on said head provided with parallel cutting edges disposed at substantially right angles to the longitudinal axis of the shank, and shoulders on said head against which said cutters bear when the shank is revolved in a direction to cause said cutters to act on the work.

2. A tool for the purpose described, comprising a shank, a head on said shank, a pivotally mounted cutter on said head which swings outwardly into a position wherein the end portion of same projects beyond the head when the head is turned in one direc-

tion, a rigid stop or abutment on the head that limits the outward movement of said cutter, and a resilient buffer on which the cutter bears when it is in its retracted position.

3. A tool for the purpose described, comprising a shank, a two-piece head on said shank, cutters pivotally mounted on said head between the pieces of same that are adapted to move outwardly when the head is revolved in one direction, and shoulders on said head that limit the outward and inward movement of said cutters.

4. A tool for the purpose described, comprising a shank provided with a portion that is adapted to be introduced into the hand hole of a boiler header or water box, pivotally mounted cutters on said portion that are rendered operative by rotary movement of the shank in one direction and rendered inoperative by rotary movement of said shank in the opposite direction, a bearing member on said shank that is adapted to engage the outer surface of the wall in which the hand hole is formed, and means for moving said bearing member longitudinally of said shank in a direction to feed the cutters into the work.

SAMUEL B. CLAY.