W. BROWN.

STAY BOLT CUTTER.

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1,085,967. Patented Feb. 3, 1914.

Fig. 1

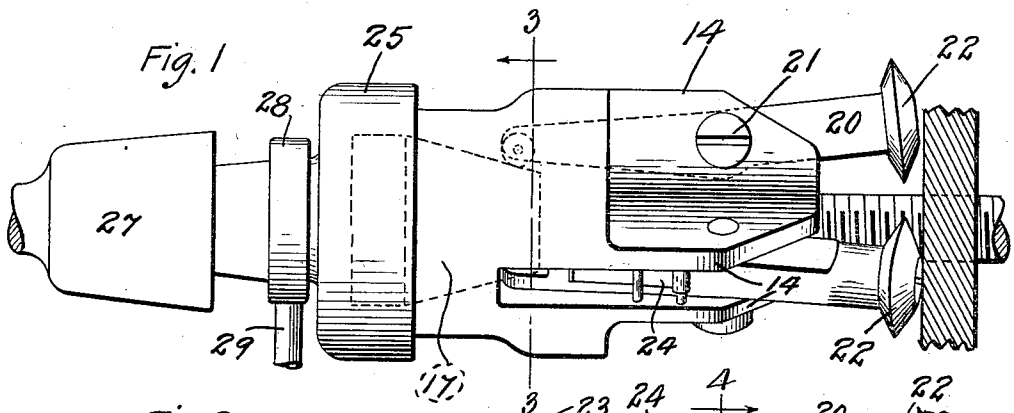


Fig. 2

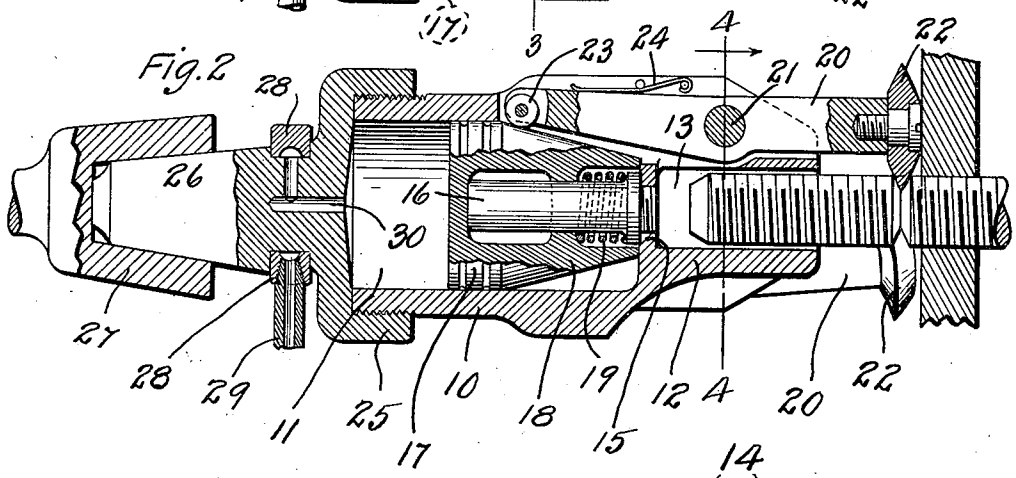


Fig. 3

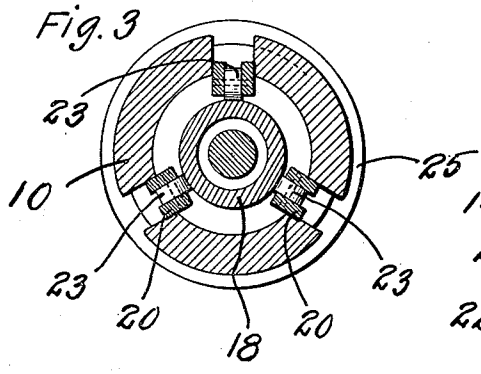
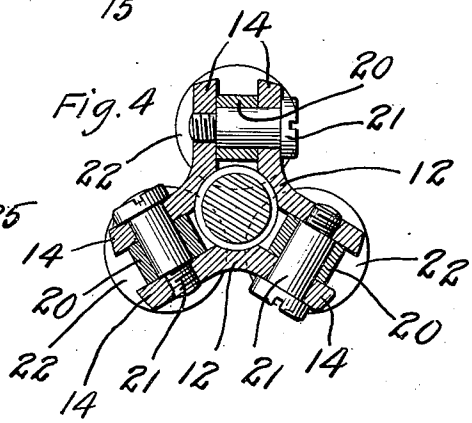


Fig. 4



Witnesses

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STAY-BOLT CUTTER.

1,085,967. Specification of Letters Patent. Patented Feb. 3, 1914.

Application filed January 29, 1913. Serial No. 744,966.

To all whom it may concern:

Be it known that I, WALTER BROWN, a citizen of the United States, residing at the city of Webster Groves, county of St. Louis, State of Missouri, have invented a certain new and useful Improvement in Stay-Bolt Cutters, 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, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to a new and improved implement or device known as a stay bolt cutter inasmuch as said tool or device is particularly designed for cutting off the projecting ends of stay bolts used in the construction of locomotive boilers and the like.

It is the well known practice to cut off the projecting ends of stay bolts by means of hammer blows upon a cold chisel or like tool, and such practice not only involves considerable time, labor and consequent expense, but very frequently ruptures the joint between the end of the stay bolt and the boiler sheet, and it is the purpose of my invention to construct a simple, inexpensive device which can be readily handled by a workman and operated with comparatively little power, and which device will very quickly cut grooves in the stay bolts immediately adjacent to the boiler sheet, thereby permitting the projecting ends of the stay bolts to be readily removed, and which action is accomplished by means of a comparatively light blow from a hammer or like tool.

To the above purposes my invention consists in certain novel features of construction and arrangement of parts hereinafter more fully described and claimed.

In the drawings: Figure 1 is a side elevational view of a stay bolt cutter of my improved construction. Fig. 2 is a sectional view taken lengthwise through the center of the stay bolt cutter. Fig. 3 is a cross-section taken on the line 3—3 of Fig. 1. Fig. 4 is a cross section taken on the line 4—4 of Fig. 2.

In the construction of the tool as shown 10 designates a cylindrical body having a chamber 11, and formed integral with one end of said body is an extension 12 having an axially arranged recess 13 and also having radially arranged pairs of ears 14, the openings between which extend rearwardly into the cylindrical body 10. There are preferably three pairs of ears 14, the same being arranged at equal distances apart.

Seated in the wall 15 between the recess 13 and the chamber 11 is one end of a stem 16, and arranged to slide freely through the chamber 11 and upon this stem is a piston 17 the forward end of which is cone-shaped, as designated by 18.

Arranged upon the stem 16 against a shoulder at the end which is seated in the wall 15 and an internally formed shoulder on the piston 17 is a compression spring 19 which tends to normally maintain the piston at the rear end of the chamber 11, as shown by dotted lines in Fig. 1.

A lever 20 is arranged between each pair of ears 14, said lever being fulcrumed on a pin or bolt 21 seated in said ears, and journaled in any suitable manner upon the forward end of each lever is a rotary cutting disk 22 of hardened metal. Journaled in the rear end of each lever 20 is a small roller 23 which normally bears upon the conical surface 18 of the piston 17. A flat spring 24 is arranged between each pair of ears 14 and bears upon the rear portion of the corresponding lever 20 in order to maintain the roller at the rear end of said lever against the conical surface of the piston.

Removably seated upon the rear end of the cylinder 10 is a cap 25 provided with a shank 26 which is adapted to be connected to the socket 27 of a motor or driving member such as an air drill.

Mounted for rotation upon the shank 26 is a ring or collar 28 provided with an internal groove, and connected to this collar and communicating with the groove therein is a tube 29 which is adapted to be connected to a suitable source of compressed air supply. A port 30 formed through the cap 25 establishes communication between the internal groove or collar 28 and the interior of the chamber 11.

In the use of my improved stay bolt cutter the shank 26 is connected to a suitable motor and the entire device is now moved forward so that the cutting disks 22 are positioned around the projecting end of a stay bolt, which projecting end enters the recess 13 in the forward end of the tool. When the disks 22 reach positions immediately

adjacent to the boiler sheet, as shown in Fig. 1, the operator starts the motor or air drill and immediately thereafter manipulates the valve or other controlling device which admits compressed air through the tube 29. The compressed air passes from the internal groove within the cut ring or collar 28 through the port 30 into the chamber 11, and as a result, the piston 17 is moved toward the forward end of said chamber, thereby overcoming the resistance offered by the spring 19 and causing the rear ends of the levers to move outward by reason of the engagement of the rollers 23 upon the conical surface of the forward end of said piston. Such movement swings the levers 20 upon the pins 21, thereby moving the forward ends of said levers inward, and as a result the edges of the disks 22 are brought into contact with the surface of the stay bolt at a point immediately adjacent to the boiler sheet. The air pressure is maintained within the chamber 11 during the time the tool is in operation, and as a result, the deep groove is rapidly cut in the projecting end of the stay bolt by the cutting disks which revolve rapidly around said stay bolt and bear thereagainst. When a groove of sufficient depth has been cut in the stay bolt the valve or device in the compressed air pipe 29 is manipulated so as to relieve the pressure within the chamber 11, and thereupon the piston 17 will move to the rear end of the chamber under the influence of the spring 19, thereby permitting the rear ends of the levers 20 to move inwardly under the influence of the springs 24. The tool is now withdrawn and shifted to the next stay bolt and the operation repeated and in this manner the projecting ends of all of the stay bolts can be very rapidly cut or grooved so as to be easily and quickly removed by blows of a hammer or like tool.

A tool of my improved construction is compartively simple, is comparatively light in weight and can therefore be manipulated by a single operator, and the projecting ends of stay bolts can be readily grooved so that they can be easily and quickly removed without affecting the joints between said stay bolts and the boiler sheet.

It will be readily understood that minor changes in the size, form and construction in the various parts of my improved stay bolt cutter can be made and substituted for those herein shown and described without departing from the spirit of my invention, the scope of which is set forth in the appended claims.

I claim:

1. In a tool of the class described, a cylinder adapted to be rotated, a plurality of arms fulcrumed thereon, cutters carried by said arms in front of the cylinder, which cutters are adapted to engage and cut an annular groove in the work as said cylinder is rotated, a piston within said cylinder the forward end of which piston is cone shaped and engages the rear ends of the arms when moved forwardly in said cylinder and an axially arranged guide for said piston, which guide is fixed to the cylinder.

2. In a device of the class described, a cylinder adapted to be rotated, a series of arms fulcrumed thereon, cutters on said arms in front of said cylinder, which cutters are adapted to engage and cut an annular groove in the work as said cylinder is rotated, a fluid pressure actuated piston within said cylinder the forward end of which piston is cone shaped and engages the rear ends of said arms, a guide for the piston, which guide is fixed to the cylinder and projects into the recess in the cylinder and means on the rear end of the cylinder which is adapted to be engaged by driving means.

3. In a device of the class described, a cylinder adapted to be rotated, arms fulcrumed thereon, cutters carried by said arms in advance of the cylinder, which cutters are adapted to engage and cut an annular groove in the work as said cylinder is rotated, a fluid pressure actuated piston within the cylinder the forward end of which piston is conical and engages the rear ends of the arms so as to swing the same upon their fulcrums, and a guide fixed to the cylinder for said piston.

4. In a tool of the class described, a cylinder arranged to be rotated, a series of levers fulcrumed on said cylinder, which levers carry cutting members, a fluid-pressure actuated piston within the cylinder, which piston is provided with a cone-shaped portion which engages the rear ends of the cutter carrying arms, a guide fixed to the cylinder and projecting into an opening in the piston, and a spring interposed between the cylinder and the piston for returning the latter to the rear end of said cylinder.

5. In a tool of the class described, a cylinder arranged to be rotated, a series of levers fulcrumed on said cylinder, which levers carry cutting members, a fluid-pressure actuated piston within the cylinder, which piston is provided with a cone-shaped portion which engages the rear ends of the cutter carrying arms, a guide fixed to the cylinder and projecting into an opening in the piston, a spring interposed between the cylinder and the piston for returning the latter to the rear end of said cylinder, and means for introducing fluid-pressure into the rear end of the cylinder.

6. In a device of the class described, the combination with rotary driving means, of a cylinder adapted to receive fluid pressure, a piston within said cylinder and operating under the influence of the fluid pressure de-

livered into said cylinder, which piston has a cone shaped forward end a series of arms fulcrumed on the cylinder, which arms are engaged by the cone shaped forward end of the piston, cutters carried by said arms, an axially disposed guide fixed to the cylinder and projecting into the forward end of the piston, and a spring interposed between said guide and piston for returning the latter to the rear end of the cylinder.

7. A stay bolt cutter comprising a cylinder adapted to receive fluid-pressure, a piston within said cylinder and adapted to be moved forwardly therethrough under the influence of fluid-pressure, an axially disposed guide fixed to the forward portion of the cylinder and projecting into the piston, a spring for forcing the piston into the rear end of the cylinder, said piston having a conical forward end, a series of arms fulcrumed to the cylinder, the rear ends of which arms bear on the conical portion of the piston, cutting members carried by the forward ends of the arms, and the forward end of the cylinder being provided with a recess which is adapted to receive the end of the work engaged by the cutters.

8. In a device of the class described, a cylinder adapted to be rotated and to receive fluid-pressure, a series of arms fulcrumed on said cylinder, cutting members carried by the forward ends of said arms, a piston within the cylinder, which piston is provided with a conical forward end, which engages the rear ends of the fulcrumed arms, a fixed guide on the cylinder for said piston, and the forward portion of said cylinder being provided with a recess which is adapted to receive a projecting end of the work engaged by the tool.

In testimony whereof I hereunto affix my signature in the presence of two witnesses, this 13th day of January, 1913.

WALTER BROWN.

Witnesses:
M. P. Smith,
Arthur B. Birge.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."