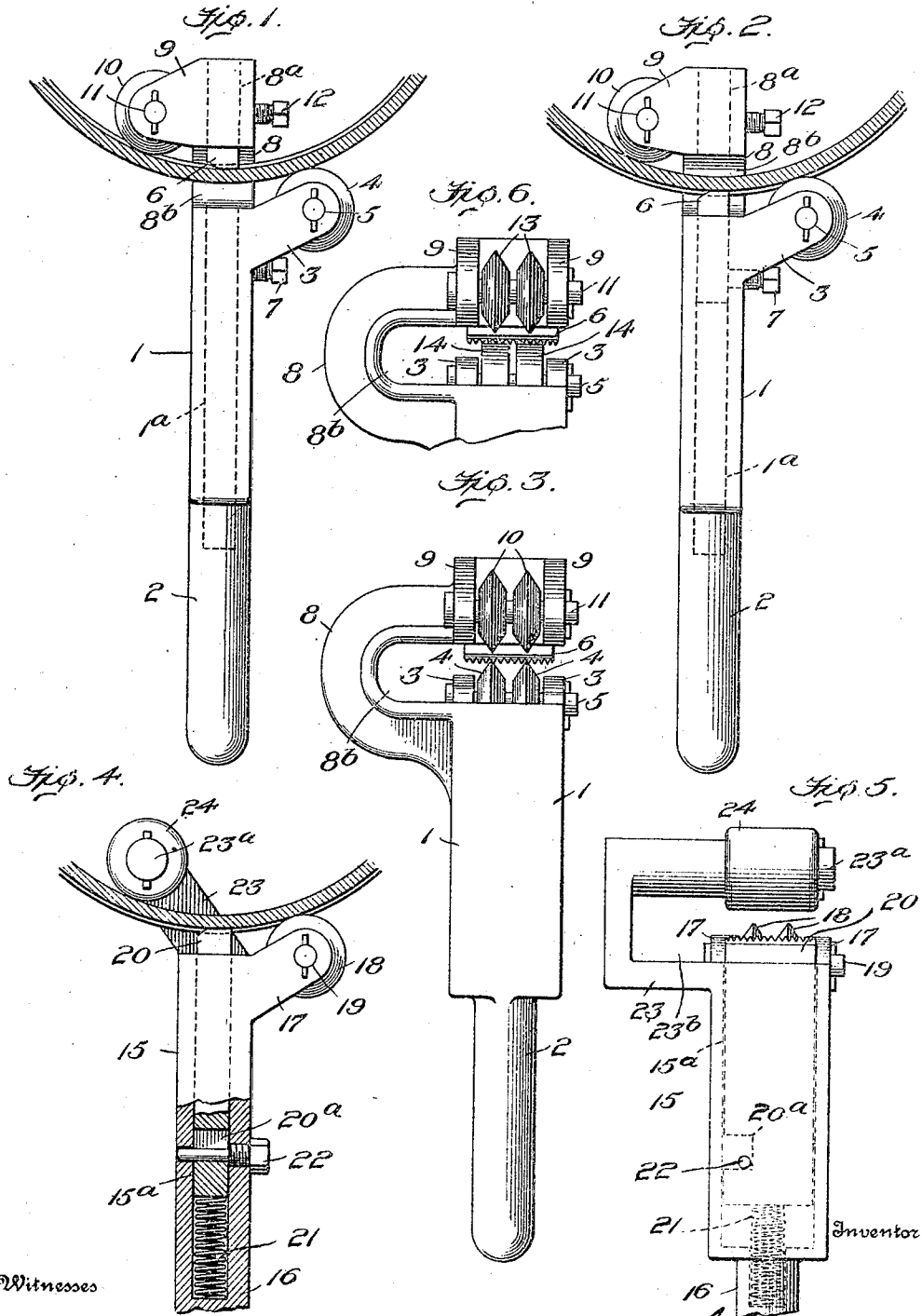


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 TOOL FOR RESTORING DAMAGED THREADS.
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Patented Mar. 15, 1910.



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TOOL FOR RESTORING DAMAGED THREADS.

952,042.

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To all whom it may concern:

Be it known that I, ALFRED G. HEGGEM, a citizen of the United States, residing at Coraopolis, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Tools for Restoring Damaged Threads; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to the construction of a tool for cleaning up or restoring damaged threads on pipes, pipe collars and sockets, and has for its principal object to provide a simple, strong and durable tool that is adapted to be efficiently and easily operated in cleaning up the threads upon widely varying sizes of pipes, pipe collars, sockets and similar threaded articles.

A secondary object of my invention is to provide an implement which is capable of cleaning inside as well as outside threads.

To these ends, the main feature of my invention, generally stated, consists in mounting a thread cutting die upon the tool body between rollers which are also mounted on said body, some of said rollers being adapted to engage the interior surface of the hollow cylindrical article to be operated upon, and some of said rollers being adapted to engage the exterior surface of said article.

There are other, minor, features of invention, residing in particular combinations and features of elemental construction, all as will hereinafter more fully appear.

In the drawings chosen for the purpose of illustrating my invention, the scope whereof is pointed out in the claims, Figure 1 is an inverted plan view of a tool constructed in accordance with my invention, part of a pipe having inside threads being also illustrated; Fig. 2 is a view similar to Fig. 1; but illustrating the operative relation of the tool to a pipe having outside threads; Fig. 3 is a side elevation of the tool, the thread cutting die being arranged for cleaning inside threads as illustrated in Fig. 1; Fig. 4 is an inverted plan view of a modified form of my invention, illustrated as embodied in a tool designed for cleaning outside threads only, part of a pipe having outside threads being also illustrated; Fig. 5 is

a side elevation of the devices illustrated in Fig. 4; and Fig. 6 is a view similar to Fig. 3, but illustrating a further modification of my invention in which both cylindrical and conical rollers are employed.

Like symbols refer to like parts wherever they occur.

I will now proceed to describe my invention more fully, so that others skilled in the art to which it appertains may apply the same.

In the construction shown in Figs. 1, 2 and 3 of the drawings, 1 is the body portion of the tool and 2 the operating handle thereof, said handle, as shown, preferably being cylindrical and rigidly connected to said body portion by being formed integral therewith. The body portion 1 is provided with suitable means, such as the perforated, projecting pivot lugs 3, 3, whereby roller devices, which are designed to bear upon the exterior of the article to be operated on, may be mounted on said body. As shown, two rollers 4, 4 are preferably employed for this purpose, said rollers being journaled on a shaft 5 which passes through the perforated roller supporting lugs. For receiving the thread cutting die 6 when the tool is to be employed for cleaning up external threads, the tool body 1 is formed with a die receiving socket 1^a which extends inwardly from the roller supporting end of the said body toward the handle 2, into which it may extend if desired. The die 6 may be conveniently secured in adjusted position in the socket 1^a by means of a set screw 7 which has threaded engagement with the tool body 1, as will be readily understood.

Secured to the tool body 1 is a yoke 8 the outer end of which is provided with perforated, roller supporting lugs 9, 9 which extend in an opposite direction from the roller supporting lugs 3, 3. A roller device preferably consisting of a plurality of rollers 10, 10, is mounted between the lugs 9, 9 by means of a shaft 11. These last named rollers are designed to bear upon the inner surface of the article to be operated on and, like the rollers 4, 4, serve to prevent the die 6 from engaging the threads too deeply. As will be noted, the rollers 4, 4 and 10, 10 are spaced apart longitudinally of the tool sufficiently far so that, when the tool is in use, said rollers simultaneously engage the

external and internal surfaces of the hollow article operated upon at points which subtend an angle at the center of the article. This spaced arrangement of the rollers is also preferably employed in the modified forms of my invention illustrated in Figs. 4, 5, and 6.

In the outer end of the yoke 8 is formed a die socket 8^a (see Fig. 2), which, as shown in Figs. 1 and 3, receives the die 6 when the tool is to be used in restoring inside threads. The die socket 8^a is preferably arranged in alinement with the corresponding socket 1^a of the tool body, both sockets being located between the rollers 4 and 10 so that the die 6, when inserted in either socket, shall extend between said rollers. The die 6 may be secured in the socket 8^a by means of a set screw 12 which has threaded engagement with the upper end of the yoke 8 and passes into the socket 8^a thereof in precisely the same manner that the set screw 7 maintains the die in operative position in the socket of the tool body.

The form of the yoke 8 is not material, provided it affords a slot 8^b which permits the respective roller devices to engage the inner and outer surfaces of the article to be operated upon.

For the sake of simplicity of manufacture and in order to facilitate the ready use of the tool, the roller devices may, as illustrated in Figs. 1, 2 and 3, consist of two sets of conical or knife edged rollers 4, 4 and 10, 10 which are identical in form and dimensions, one or the other set of such rollers thus being always capable of immediate engagement with the threads of the article and it being never necessary to do anything more than insert the die in the proper die socket in order to render the tool ready for use. Under certain conditions of practice, however, it will be found advantageous to use one set of conical or knife edged rollers and one set of flat faced or cylindrical rollers, the rollers being interchangeable so that the conical ones may be readily positioned to engage either inside or outside threads and the flat faced ones may always engage the unthreaded surface of the article to be operated upon. Such a construction is illustrated in Fig. 6, wherein the rollers and die are shown as arranged for cleaning inside threads, 13, 13 being the conical rollers and 14, 14 being the cylindrical ones. The other features of construction of the modified form of tool illustrated in Fig. 6 are identical with the corresponding parts illustrated in Figs. 1, 2 and 3 and heretofore described, and such parts have, therefore, been indicated by corresponding letters of reference.

The tool illustrated in Figs. 4 and 5 of the drawings is designed for restoring damaged aged outside threads only. In such con-

struction, 15 is the body portion of the tool and 16 a suitable handle rigidly connected to said body. Attached to and projecting outwardly from the body portion 15 are perforated roller supporting lugs 17, 17 between which conical rollers 18, 18 are journaled by means of a shaft 19, these features of construction being identical in form, purpose and arrangement with the like devices illustrated in the principal figures of the drawings. The tool body 15 is formed with a die receiving socket 15^a which extends inwardly from the roller supporting end of said body toward the handle 16 for a distance sufficient to properly receive the thread cutting die 20 and a spring 21 which is interposed between the inner end of said die and the bottom of the socket. This spring yieldingly maintains the cutting face of the die 20 in proper engagement with the threads of the article operated upon, as will be readily understood. In order that the die may be maintained in the die socket and yet be capable of properly adjusting its position to threaded articles of different diameters, it is preferred to slot or notch the shank of the die 20 as at 20^a and to pass through said notch a stop pin 22 having threaded engagement with the tool body 15, the arrangement, as shown, being such that the thread cutting die is permitted to have a limited reciprocation in the die socket 15^a. Secured to the tool body 15 is a yoke 23 which is provided at its end with a reduced cylindrical portion 23^a forming a journal upon which a cylindrical roller 24 is mounted, said roller being maintained on its journal by means of a cotter pin. As this modified form of tool is only intended to operate upon hollow articles having external threads, it is unnecessary to provide the yoke 23 with a die socket. The form of the yoke 23, though somewhat different from the yoke illustrated in Figs. 1, 2, 3 and 6, affords a slot 23^b which permits the rollers 18 and 24 to respectively engage the threaded and unthreaded surfaces of an externally threaded hollow article.

Although, as indicated throughout the several views, it is preferred to employ a thread cutting die in conjunction with the rollers, since such a construction permits of the facile restoration of badly damaged threads, yet the die may be omitted and the knife edged or conical rollers be directly employed for restoring the threads. When the thread cutting die is not to be employed, it is preferred, as illustrated in Figs. 4, 5 and 6, to employ both cylindrical and conical roller devices.

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

1. In a tool for restoring threads upon hollow articles, the combination with a tool body, of a plurality of rollers journaled

thereon, there being at one end of said rollers an entrance to the space between them, so as to permit the insertion of the article to be operated upon with some of said rollers inside and other of said rollers outside the hollow article, and a cutting die, the die being so related to the rollers that its cutting edge may be adjusted to lie in one of the bounding lines of an annulus tangent to and passing between said rollers and the cutting edge of said die lying between the radii of the annulus passing through the points of tangency.

2. In a tool for restoring threads upon hollow articles, the combination with a tool body having a die receiving socket therein, of a roller device mounted upon said tool body, a yoke connected to said tool body, a roller device mounted on said yoke, and a thread cutting die mounted in said socket, said yoke forming a slot permitting some of said roller devices to engage the inner surface of the hollow article to be operated upon and some of said roller devices to engage the outer surface of said hollow article.

3. In a tool for restoring threads upon hollow articles, the combination with a tool body having a die receiving socket, of a yoke connected to said tool body, said yoke being provided with a die receiving socket, a thread cutting die, a roller device mounted on said tool body, and a roller device mounted on said yoke, the axes of said roller devices being permanently fixed with respect to each other.

4. In a tool for restoring threads upon hollow articles, the combination with a tool body having a die receiving socket, of a thread cutting die adapted to be mounted in said socket, a yoke connected to said tool body, knife edged rollers mounted on said tool body and a roller device mounted on said yoke.

5. In a tool for restoring threads upon hollow articles, the combination with a tool body having a die receiving socket, of a yoke connected to said tool body, said yoke

having a die receiving socket therein, a thread cutting die adapted to be mounted in either of said sockets, and a plurality of rollers some of which are mounted upon the tool body and some of which are mounted upon the yoke, some of said rollers being knife edged and the roller device mounted on the yoke being interchangeable with the roller device mounted on the tool body.

6. In a tool for restoring threads upon hollow articles, the combination with a tool body having a die receiving socket therein, of a yoke rigidly connected to said tool body and provided with a die receiving socket, knife edged rollers mounted upon said tool body, knife edged rollers mounted upon said yoke, and a thread cutting die which is adapted to be mounted in either of said sockets to extend between the rollers mounted upon said tool body and the rollers mounted upon said yoke.

7. In a tool for restoring threads upon hollow articles, the combination with a tool body, of a plurality of rollers journaled thereon, there being at one end of said rollers an entrance to the space between them, so as to permit the insertion of the article to be operated upon with some of said rollers inside and other of said rollers outside the hollow article, and some of said rollers being knife-edged.

8. In a tool for restoring threads upon hollow articles, the combination with a tool body provided with a slot adapted to receive a portion of the article operated upon, of a plurality of rollers mounted on said body and adapted to simultaneously engage the inner and outer surfaces of the article, said rollers being interchangeable and some of them being knife edged.

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

ALFRED G. HEGGEM.

Witnesses:

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R. A. STEWART.