E. T. McPHERSON.

CHUCK.

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1,224,945.

Patented May 8, 1917.

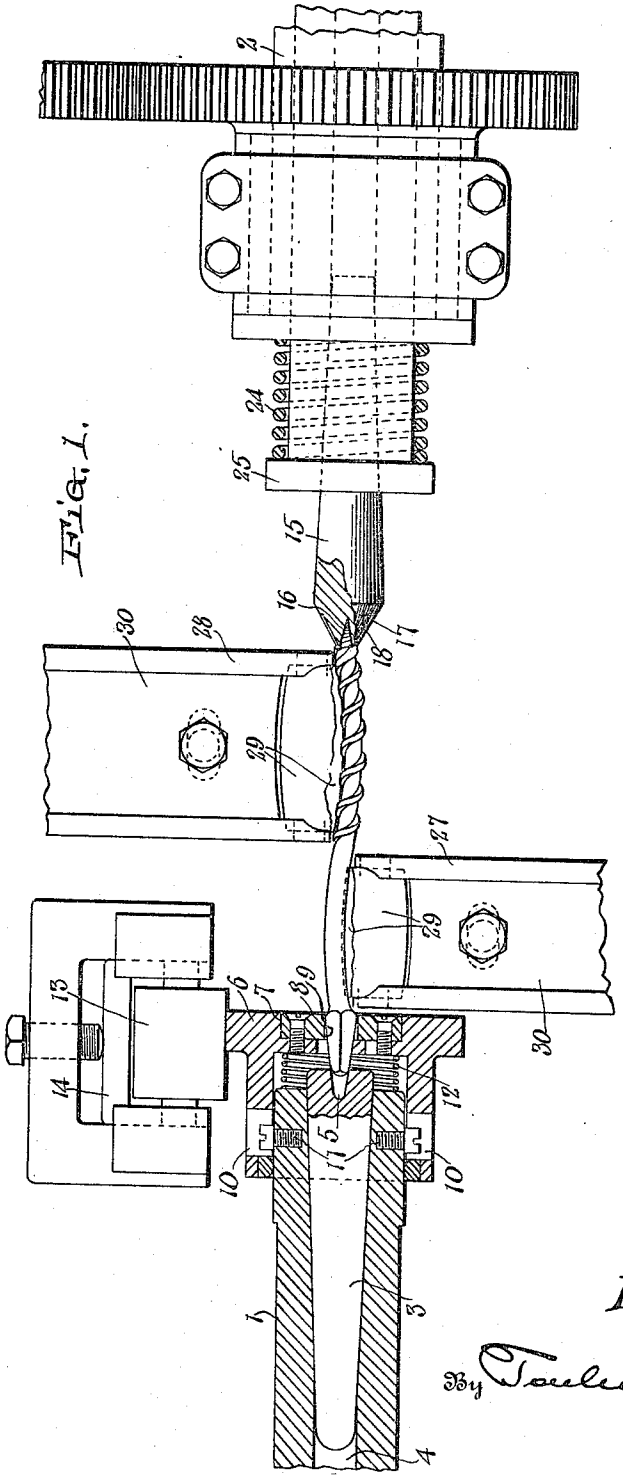


Fig. 1.

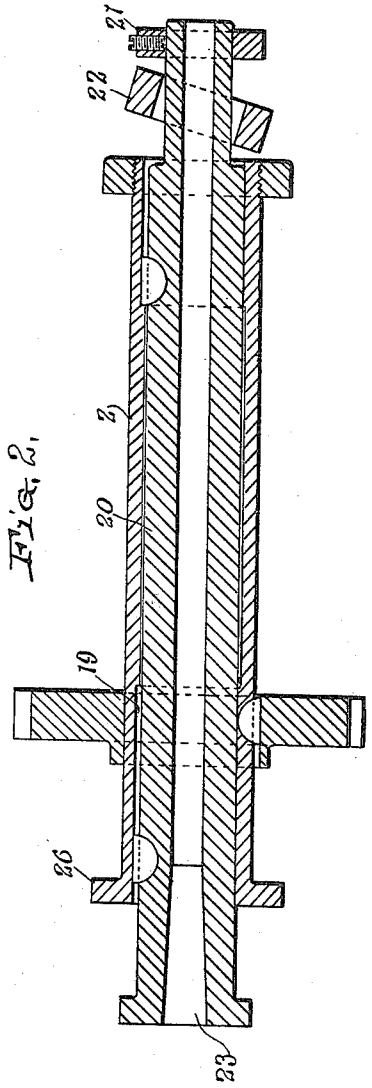


Fig. 2.

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UNITED STATES PATENT OFFICE.

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CHUCK.

1,224,945. Specification of Letters Patent. Patented May 8, 1917.

Original application filed May 20, 1915, Serial No. 29,285. Divided and this application filed April 20, 1916. Serial No. 92,347.

To all whom it may concern:

Be it known that I, ELMER T. McPHERSON, a citizen of the United States, residing at Wilmington, in the county of Clinton and State of Ohio, have invented certain new and useful Improvements in Chucks, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to chucks especially adapted for use in connection with machines for straightening auger bits and the like.

The present application is a division of an application filed by me May 20th, 1915, Ser. No. 29,285 on which Letters Patent No. 1,184,551 were granted May 23rd, 1916.

The object of the present invention is to provide chucks which are especially adapted for use in machines for straightening auger bits and the like and which will aid in the straightening operation.

In the accompanying drawings, Figure 1 is a plan view, partly in section, of the bit-supporting chucks and showing a part of the straightening devices; and Fig. 2 is a sectional view of one of the chuck-supporting shafts.

In carrying out my invention I provide two bit-supporting devices adapted to rotate about coincident fixed axes. These bit-supporting devices are of such a character that they will receive the respective ends of the bit and cause these ends of the bit to rotate about the axes of the respective bit-supporting devices. It will be obvious that in so rotating the bits any parts of the same which are out of true will travel in a path eccentric to the axis of rotation of the ends of the bit. To eliminate the irregularities from the bit I provide one or more bit straightening devices which are arranged to act on the bit between its ends while it is being rotated and thus straighten the same. The straightening device is adapted to be applied between the ends of the bit and the ends of the bit are supported in chucks which embody my invention. In the particular embodiment of the invention here illustrated I have shown a pair of shafts 1 and 2 which are in axial alinement and are adapted to be simultaneously rotated. The means by which the shafts are rotated has not been shown as the particular arrangement used was fully shown and described in my copending application, Ser. No. 29,285, above mentioned. Each shaft is provided on its inner end with a bit-supporting device or chuck adapted to receive one end of a bit and hold the same against rotation relatively to its shaft. The two chucks are adapted, respectively, to receive the shank and the point or cutting end of the bit. That chuck on the shaft 1 is here shown as adapted to receive the shank of the bit and, to this end, it comprises a tapered portion 3 mounted in a tapered recess of the shaft 1, which recess is indicated at 4. The part 3 at its forward end is provided with a socket 5 adapted to receive the extreme end portion of the shank of the bit, this socket being arranged in the axis of rotation of the shaft. Mounted about this socket and extending in front thereof and secured to the forward portion of the shaft 1 is a sleeve or head 6 which extends some distance in front of the socket and is provided with a recess 7 to receive a plate 8, this plate having an aperture 9 to receive the larger portion of the tapered shank. The head 6 is slidably mounted on the forward portion of the shaft 1 which constitutes a socket member, and, to this end it is provided with longitudinal slots 10 through which extend screws 11 by means of which it is connected with the socket member, the screws being secured to the forward portion of the shaft 1 or socket member and projecting into the slots. A spring 12 is interposed between the head and the forward portion of the shaft 1 and tends to hold the parts in their most widely separated positions. It will be noted that this chuck grips the shank at two separated points. The head 6 is loosely mounted on the end of the shaft 1 so that it is capable of slight lateral movement. The side of the head bears against a guide roller 13 which is arranged a distance from the axis of the socket 5 equal to the radius of the head 6. If the shank of the bit is out of true the head will be displaced laterally to receive the same and when the bit is rotated, both ends lying in a common axis, that side of the head which has been moved away from the axis of the chuck will be engaged by the guide roller and forced back to its true position, thus straightening the shank. It will be noticed that the guide roller is

mounted in an adjustable supporting bracket 14. The chuck for the shaft 2, which is shown at 15, is provided with a socket 16 to receive the screw-threaded tip of the bit and the outer portion of the chuck is tapered or conical, as shown at 17, to fit snugly within the longitudinally projecting lips of the bit. Preferably, this tapered portion of the chuck is serrated or roughened, as shown at 18, to give the same a firm gripping action on the bit. This arrangement is such that the socket 16 will tend to straighten the tip of the bit should the latter be out of true. The chuck 15 is capable of longitudinal movement to permit of the insertion and removal of the bit and is yieldingly held in engagement with the bit. This may be accomplished in different ways. In the present instance, the shaft 2 is shown as hollow, as indicated at 19, and has mounted therein an inner shaft or spindle 20 provided on its outer end with a collar 21 to form a stop to coöperate with a shifting yoke 22 which is connected to a suitable operating means, not shown, as it forms no part of the invention. This inner spindle projects some distance beyond the inner end of the shaft 2 and is provided with a tapered socket 23 to receive the tapered end of the chuck 15. A spring 24 is coiled about the spindle between a flange 25 on the inner end of the spindle and a similar flange 26 on the end of the hollow shaft. The spring 24 is a much stronger spring than the spring 12 and when the ends are inserted in the respective chucks the spring 24 will exert a force to push the head 6 toward the left so that the reduced portion of the shank will fit tightly in the socket 5.

It will be seen that the chuck 15 can be very easily moved axially to release the bit and when released will move inwardly again to hold the bit firmly in position. The yielding character of this chuck not only permits of the insertion and removal of the bits but it also permits the chuck to accommodate itself to the different positions assumed by the end of the bit during the straightening operation and thus hold the bit firmly in check. While the change in position of the end of the bit due to the bending and straightening of the bit is not very great it is such that the grip of the chucks would be loosened if the latter were mounted in fixed positions.

I have here shown the straightening devices 27 and 28, each straightening device comprising rollers 29 mounted on parallel axes and spaced slightly apart. Each pair of rollers is mounted on a slide block or frame 30. As shown in Fig. 1, as these devices are moved inwardly or outwardly they exert a force against the rotating bit to straighten the same. A detail description and showing, however, of these devices are not made here, as they form no part of the present invention and were fully described in the application, of which this application is a division.

When it is desired to insert a bit between the chucks all that is necessary is to withdraw the chuck 15 and insert the shank within the opening 9 of the head 6. The pointed end of the bit is fixed to the chuck 15 by the release thereof and the spring 24 forces the shank rearwardly into the socket 5, so that the parts are yieldingly mounted as far as an axial direction is concerned. During the straightening operation while the bit is being rapidly rotated the straightening devices 27 and 28 will straighten the central portions of the bit, the chuck mounted upon the shaft 1 will straighten the shank and the chuck 15 will straighten the tip, as was set out above. At the end of the straightening operation the chuck 15 is withdrawn and the head 6 which has been forced back against the tension of its spring by the chuck 15 will move forward under the action of its spring, thus releasing the bit from the socket 5 and enabling the same to be readily removed. It will be noted that the yielding of the chuck 15 is such that the device will, without other adjustment of the parts accommodate bits of different lengths.

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

1. In a device of the character described, a rotatable chuck comprising a part having a socket to receive and support the tip of a shank of a bit and mounted to rotate about a fixed axis, a second part carried by said first part and movable laterally relatively thereto and having an opening to receive said shank and engage the same at a point remote from said socket, and means engaging said second part during the rotation thereof to cause said second part to move so that its opening will come into alinement with said axis during the rotation of the parts.

2. In a device of the character described, a rotatable chuck comprising a part having a socket to receive and support the tip of the shank of a bit and mounted to rotate about a fixed axis, a second part carried by said first part and movable laterally relatively thereto and having an opening to receive said shank and engage the same at a point remote from said socket.

3. In a device of the character described, a rotatable chuck comprising a part having a socket to receive and support the tip of the shank of a bit and mounted to rotate about a fixed axis, a second part carried by said first part and movable laterally relatively thereto and having an opening to receive said shank and engage the same at a point

remote from said socket, and a guide arranged to engage said second part as it rotates.

4. In a device of the character described, a chuck comprising a part mounted for rotation about a fixed axis and having a socket to receive the tip of the shank of a bit, a second part mounted on said first part for movement longitudinally and transversely thereof, a spring interposed between said parts, said second part having an opening to receive said shank and engage the same at a point remote from the tip thereof.

5. In a device of the character described, a chuck comprising a part having a socket to receive the tip of the shank of a bit and mounted to rotate about a fixed axis, a second part movable longitudinally of said first part, said parts being connected together by means of a slot and lug, said parts also being arranged to allow relative lateral play, said second part being provided with an opening remote from the socket within said first part, a spring interposed between said parts, and means adapted to engage the outer portion of said second part.

6. In a device of the character described, a rotatable chuck comprising a part having a socket to receive and support the tip of the shank of a bit and mounted to rotate about a fixed axis, a second part rotatable with said first part but mounted thereon to move longitudinally and laterally thereof, an opening in said second part remote from the socket within said first part, and means adapted to engage the outer portion of said second part during the rotation thereof.

In testimony whereof, I affix my signature.

ELMER T. McPHERSON.

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