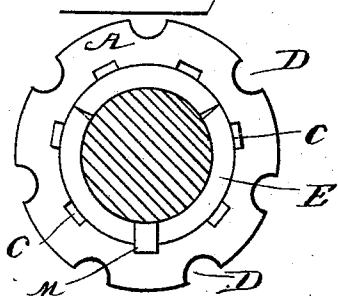
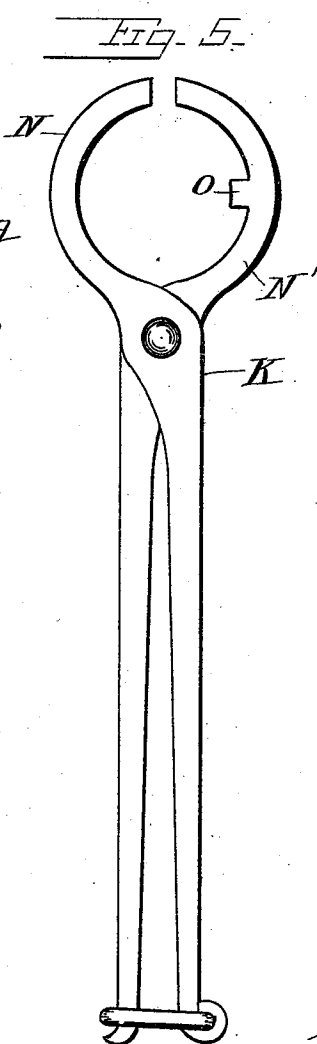
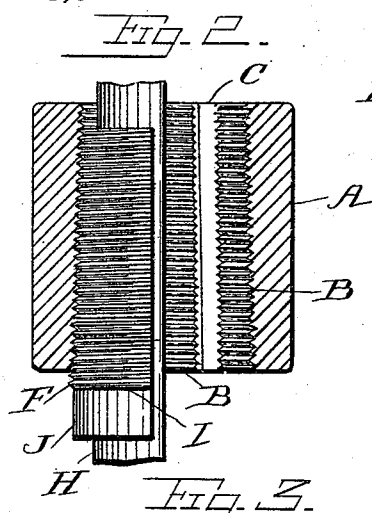
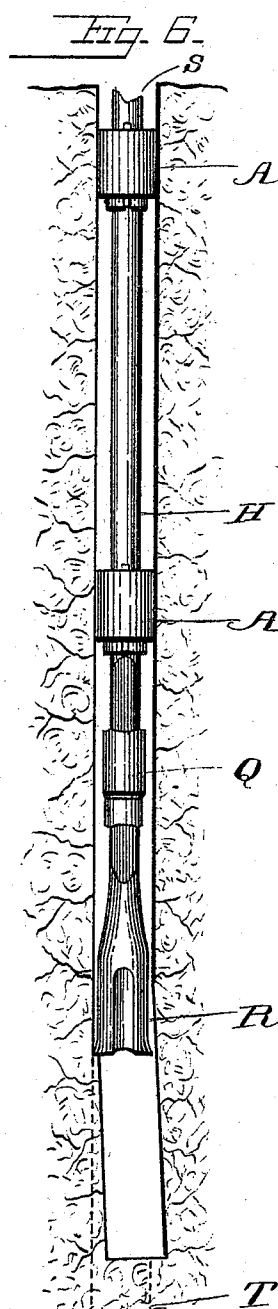
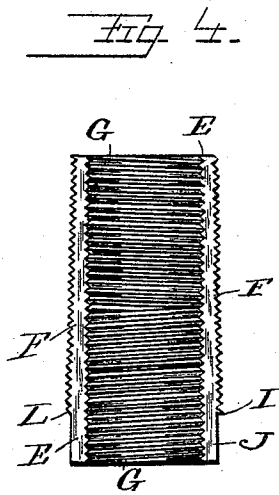
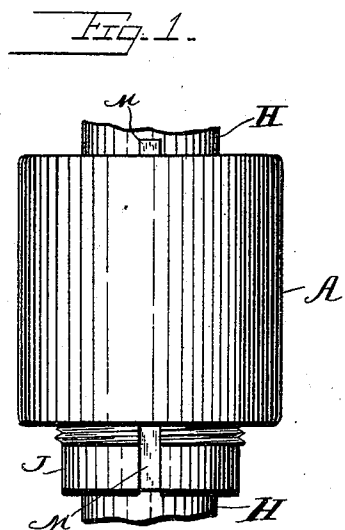


(No Model.)

P. H. MACK.
HOLE STRAIGHTENER.

No. 496,316.

Patented Apr. 25, 1893.



WITNESSES:
Geo. C. Linn
E. P. Knight

INVENTOR
P. H. Mack
BY *Knight Bros*
ATTORNEYS.

UNITED STATES PATENT OFFICE.

PATRICK H. MACK, OF BRADFORD, PENNSYLVANIA.

HOLE-STRAIGHTENER.

SPECIFICATION forming part of Letters Patent No. 496,316, dated April 25, 1893.

Application filed May 20, 1892. Serial No. 433,788. (No model.)

To all whom it may concern:

Be it known that I, PATRICK H. MACK, a citizen of the United States, residing in the city of Bradford, county of McKean, and State of Pennsylvania, have invented certain new and useful Improvements in Hole-Straighteners for Oil and Artesian Wells; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, and in which—

Figure 1 is a side elevation of my device showing it secured to a portion of the auger stem. Fig. 2 is an axial section of the collar, also an elevation of a portion of the auger stem divided axially in a plane at right angles to the sectional plane of the collar. On this portion of the auger stem is shown a screw-threaded wedge engaged with the threads of the collar. Fig. 3 is a plan of my device as shown in Fig. 1. In this view are shown semi-circular grooves in the face of the collar. Fig. 4 is a side elevation of one of the wedges, with the inside or concave face presented. Fig. 5 represents a clamping tool for holding the wedges. Fig. 6 is a view of the hole straightener in use in the well.

My invention relates to that class of oil well "fishing tools," that are used for straightening what are termed by drillers "crooked holes."

The object of my invention is to provide an improved hole straightener, that will be simple in construction, effective and reliable when in operation and that can be easily connected to or disconnected from the drilling tools by the driller at the well, the auger stem forming a part of this device.

In the drawings—A is a collar, the outside diameter of which is the size of the well-hole. The outer face of this collar (see Fig. 3) is provided with longitudinal grooves D, for the passage of the fluid it displaces in its movements in the well while its inner face is provided with square grooves C for the reception of a feather or key M (Figs. 1 and 3) to be referred to hereinafter.

E represents wedges whose concave faces are provided with serrations or screw-threads to prevent them from slipping on the stem, when in use.

In Fig. 4 a wedge E is shown with a right-hand screw-thread on its upper half and a left-hand screw-thread on its lower half. This method of preparing the concave surface of the wedges E I prefer because the threads not only prevent the wedges E from slipping longitudinally, but also from turning on the auger stem H, when the collar A, is screwed on or off. The same object can be accomplished, however, by preparing the entire concave face of one of the wedges, with a right-hand screw-thread and the entire concave face of the adjoining wedge with a left-hand screw-thread and so continue with the entire set used. The wedges E, are formed at their lower ends, with a smooth outside surface J of less diameter than the adjoining threaded parts, in order that they may be grasped and held by the clamps K. By so constructing the wedges a shoulder or offset L is formed which rests on the face of the clamp K, and by this means the ends of the screw-threads F, of the several wedges E when placed in position on the auger stem H, will coincide with each other in the same spiral plane, and thereby permit the thread B of the collar A to engage with them when screwing the collar A on the wedge E. A set of the wedges E does not form a complete circle around the periphery of the auger stem H, but a space is left for the insertion of the key M, (see Figs. 1 and 2.)

K, is a clamping tool in the form of a pair of tongs with jaws N and N' made semi-circular for the purpose of grasping the smooth surfaces J of the wedges E on the auger stem H. On the inner periphery of the jaw N' is the projection O, corresponding in width to the key M, and adapted to enter between two of the wedges E, so that when the collar A is screwed over the wedges E, the latter will be held apart at such distance as to allow the key M, to be inserted between them.

For practical use a set of two of my devices is preferably used as shown in Fig. 6, and the method of using them is as follows: A string of drilling-tools being suspended in the derrick with no tool attached to the auger stem H, the collar A is passed up over the box Q, and held while the auger stem H, which it encircles, is lowered into the well-

hole a sufficient distance to bring the upper end of said auger stem on which one of the devices is to be secured, within reach of the driller. A set of the wedges E, is then placed
 5 on the auger stem H, at the desired location and clasped by the clamp K, as described above. The collar A, is then screwed down over the wedges E with such force as to embed the serrations G, into the auger stem H, while the pro-
 10 jection O, keeps the key-space open. The screw-threads B and F, being reasonably fine, the collar A can always be screwed down firmly and yet stopped at such a point as to leave one of the several key-seats C, opposite
 15 the key-space of the wedges E. This being done, the key M, is inserted and operates to bind all the parts securely to the auger-stem H. After securing the collar as described, the auger-stem H, is raised and a similar de-
 20 vice is in like manner fastened at its lower end. A round-reamer R is now screwed into the auger-stem box Q, and the hole-straightener is ready for use.

In Fig. 6, S, represents the well-hole which
 25 is shown at the bottom as deviating from the perpendicular, which is represented by the dotted lines T and U. A crooked hole which is often made in drilling, is generally caused by the drilling bit entering a slanting crevice in the rock, and starting to drill the hole
 30 at an angle. This results in binding the tools and arresting the progress of the drill. By my method the collars A, act as guides to the drilling - tools, centering and holding the reamer R, in a position perpendicular to the
 35 balance of the tools, and causing it, as soon

as it reaches the point where the well begins to deviate from the perpendicular, to start a shoulder as shown, and continue cutting in a perpendicular line downward as indicated
 40 by the dotted line U, until the bottom of the well-hole is reached. Then the straighteners can be removed, the reamer replaced by the drilling-bit and the drilling proceeded with.

Having thus described my invention, what I claim is— 45

1. In a well boring tool the combination of the stem, the interiorly screw-threaded collar adapted to surround the stem and fit the well hole, the wedges adapted to fit between the collar and stem and provided with interior serrations having cutting edges for embed-
 50 ding into the smooth periphery of the stem at any point to prevent slipping vertically, and a lower contracted portion having a smooth outer surface for receiving the clamp-
 55 ing tool K substantially as set forth.

2. In a well boring tool the combination of the stem, the interiorly screw threaded collar adapted to surround the stem and fit the
 60 well hole and the wedges adapted to fit between the collar and stem, exteriorly screw-threaded to receive the collar and interiorly screw-threaded in two directions to prevent
 65 slipping circumferentially when the collar is screwed on and to prevent slipping longitudinally as explained.

PATRICK H. MACK.

Witnesses:

BEN R. HAGAR,
 E. C. HEATHCOTE.