

W. FORKER.

Improvement in Tools for Enlarging the Bore of Oil-Wells.

No. 131,263.

Patented Sep. 10, 1872.

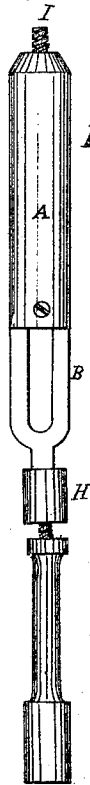


Fig 1.

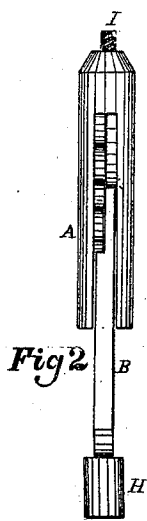


Fig 2.

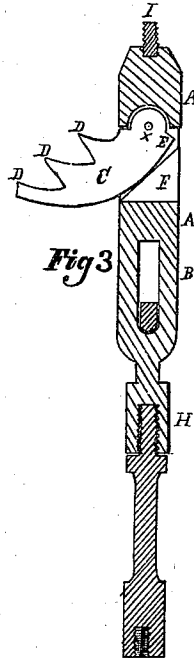


Fig 3.

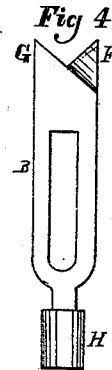


Fig 4.

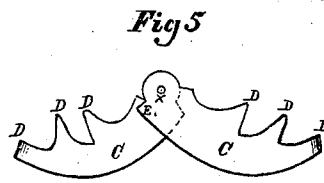


Fig 5.

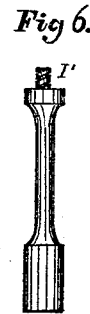


Fig 6.

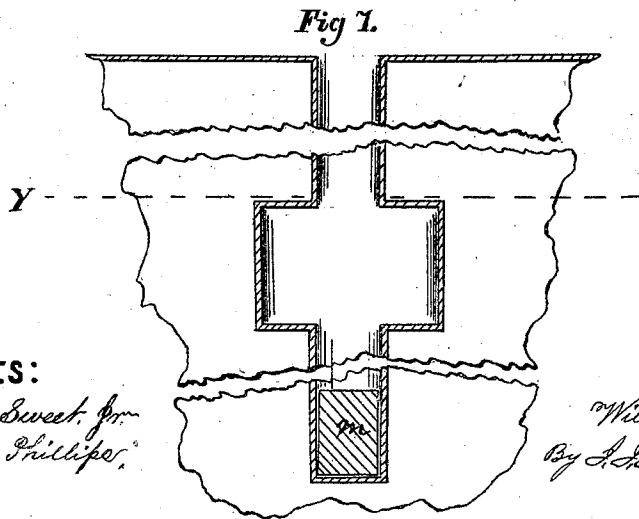


Fig 7.

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UNITED STATES PATENT OFFICE.

WILLIAM FORKER, OF ROCKLAND, PENNSYLVANIA.

IMPROVEMENT IN TOOLS FOR ENLARGING THE BORES OF OIL-WELLS.

Specification forming part of Letters Patent No. 131,263, dated September 10, 1872.

To all whom it may concern:

Be it known that I, WILLIAM FORKER, of Rockland, Venango county, Pennsylvania, have invented a certain new and useful Improvement in Drilling Apparatus for Enlarging the Bore of Oil-Wells; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing and to the letters of reference marked thereon.

The nature of my invention consists in a drilling apparatus, constructed as hereinafter described, for the purpose of enlarging the bore of oil-wells in their oil-producing part.

To enable others skilled in the art to make and use my invention, I will proceed to describe more fully its construction and operation.

In the accompanying drawing, which forms part of this specification, Figures 1 and 2 represent side elevations of my improvement in drilling apparatus for enlarging the bore of oil-wells in their oil-producing part. Fig. 3 is a vertical section of the same. Fig. 4 represents a side view of the lower part of the drilling apparatus, or that part which is used for driving out the drills to their work. Fig. 5 represents a side view of the drills. Fig. 6 represents a side view of one of the lengthening pieces, which I secure to the end of the lower part of drilling apparatus, for the purpose hereinafter explained. Fig. 7 is a diagram of an oil-well, which diagram is for the purpose of illustrating the manner of enlarging the bore of oil-producing part of the oil-well by means of my improvement in drilling apparatus.

In the accompanying drawing, A represents the upper part, and B the lower part of drilling apparatus. These parts are coupled together and work, the one part in the other, similar to an ordinary pair of "jars" of oil-tools, and may very properly be called "jars." In the part A are pivoted, at X, drills C, which are provided with a number of cutting-points, D. The form of said drills and the cutting-points are clearly shown in Fig. 5. The drills C are provided with shoulders, E, which are used for the purpose of preventing them from falling back beyond the desired point. The upper end of the part A is provided with a screw-pin, I, which is adapted to the screw-box or nut made in the lower end of the

of the ordinary oil-tools. The upper end of the part B is provided with two inclines, F and G, which inclines are brought in contact with the back of the drills C at each stroke of the drilling apparatus. In the lower end of the part B is a screw-box or nut, H, into which is screwed the screw-pin I of the lengthening piece represented in Fig. 6.

From the foregoing description, and by reference to the accompanying drawing, the skillful mechanic will readily understand the construction of the several parts of my improvement in drilling apparatus, and the relation of the different parts to each other. I will, therefore, proceed to describe the operation of the apparatus.

The oil-well is "bored" in the usual manner by means of the ordinary boring-tools. I then place in the bottom of the well a piece of iron or steel about two feet in length, the diameter of it being nearly equal to the diameter of the bore of the oil-well. I then, by means of the screw-pin I, connect the drilling apparatus to the "jars" of the ordinary oil-tools. I then secure to the lower end of the part B the reamer of the ordinary oil-tools. The drilling apparatus and the parts of the oil-tools to which it is attached are lowered into the well by the same means and in the same manner that the ordinary drilling-tools are lowered into the well. The several parts of the "oil tubes," and the drilling apparatus attached to them, are lifted up and dropped in the same manner that the oil-tools are lifted and dropped for boring oil-wells. The reamer attached to the part B strikes against the iron or steel piece *m* placed in the bottom of the well, and thereby allows the part A and the several parts to which it is attached to descend, which will bring the back of the drills C with great force down on the inclines F and G of part B, which will force the cutting-points D into the walls of the oil-well. The several parts being lifted for a second downward stroke, the drills C will drop back by their own gravity ready to be forced out for a second cut, and thus will the several parts described continue to work with the lifting and dropping of the parts, as described, said parts being rotated in the same manner that "oil-tools" are rotated while drilling an oil-well. The reamer on the lower end of part B is used for the purpose of crush-

ing the matter cut out of the walls of the well as fast as it falls down on the iron or steel piece *m* placed in the bottom of the well, so that the said matter can be removed from the well by means of the "sand pump," as in the case of boring oil-wells in the ordinary way. The iron or steel piece is placed in the bottom of the well to form a base, upon which may be crushed the matter cut out of the walls of the well, and also to prevent the well from being sunk below the point desired. In enlarging the bore of the well at the oil-producing part of it (which is in the sand-rock) I enlarge that portion of the well which is below the sand-rock, so that it will be undermined, as shown in Fig. 7, in which the sand-rock is represented as being above the dotted line Y. Having the sand-rock thus undermined, I then remove the drilling apparatus from the well, and then detach the reamer from the part B and attach to it a suitable lengthening piece, such as is shown in Fig. 6, to the lower end of which I attach the reamer, (the lower end of the lengthening piece being provided with a screw-box or nut, into which the screw-pin of the reamer is screwed.) The drilling apparatus is again lowered into the well and the drilling operation renewed. It will be observed that by attaching the lengthening piece to the part B and the reamer to it the drills C will be brought in contact with the lower part of the sand-rock, which is then cut away until the drills C cease to operate. The drilling apparatus is then removed, and the lengthening piece removed and a longer one substituted, so that another portion of the sand-rock may be cut away; and thus one lengthening piece is replaced by another until the desired en-

largement is made in the sand-rock at the oil-producing point in the well. By enlarging the bore of the oil-well in the manner herein described the productiveness of the well will be greatly increased, and it will not be so liable to become clogged up by dirt, paraffine, and other matter, which tend to diminish the flow of oil into the well.

By the use of the drilling apparatus hereinbefore described and operating in the manner set forth, the bore of oil-wells can be readily enlarged at the point desired, which enlargement will be accomplished with great facility and at diminished cost, as compared with the means now used for that purpose. By constructing the drills C in the form herein represented and providing them with a number of cutting-points, as indicated at D, their cutting capacity will be greatly increased, and they will readily free themselves, and are not liable to become fastened or wedged in the walls of the well during the process of drilling or enlarging the bore of the well.

Having thus described the nature, construction, and operation of my improvement, what I claim as of my invention is—

The combination of the jar-links A and B, the link A being provided with cutters C, which have cutting-points D and shoulders E, and the link B having the inclines F and G, all operating in the manner and by the means substantially as herein described, and for the purpose set forth.

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