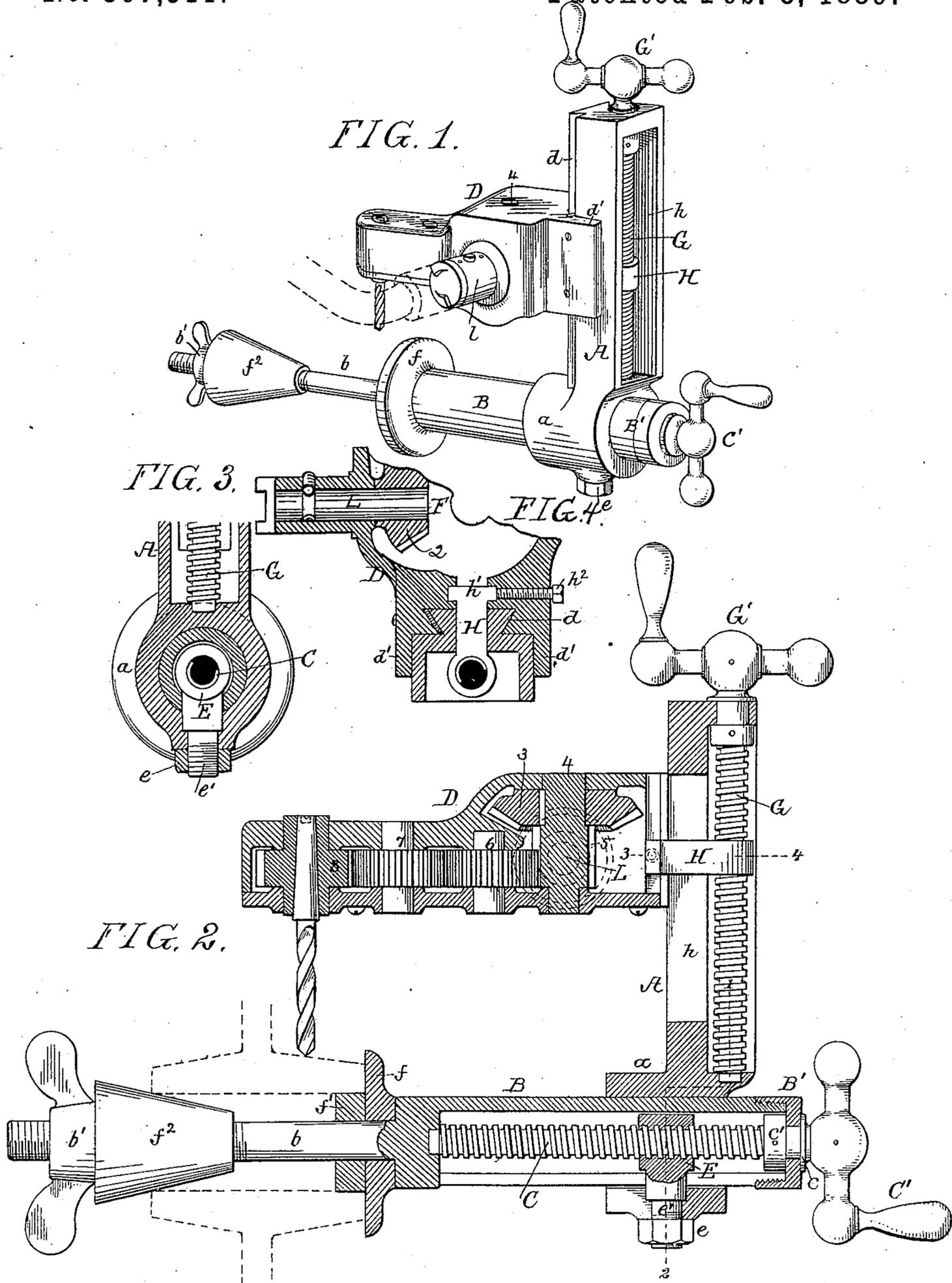


(No Model.)

F. SCHOFF.
DRILLING MACHINE.

No. 397,311.

Patented Feb. 5, 1889.



Witnesses:
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UNITED STATES PATENT OFFICE.

FREDERIC SCHOFF, OF PHILADELPHIA, PENNSYLVANIA.

DRILLING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 397,311, dated February 5, 1889.

Application filed October 27, 1888. Serial No. 289,277. (No model.)

To all whom it may concern:

Be it known that I, FREDERIC SCHOFF, a citizen of the United States, and a resident of Philadelphia, Pennsylvania, have invented certain Improvements in Drilling-Machines, of which the following is a specification.

The object of my invention is to construct a simple and handy drilling-machine for boring or tapping the set-screw holes and oil-holes in pulleys.

The machine which I will now proceed to describe is to be used as a portable drilling-machine in connection with a flexible driving-shaft; but it will be evident that the machine can be either permanent or portable, and driven by belting in the usual manner.

In the accompanying drawings, Figure 1 is a perspective view of my improved drilling-machine. Fig. 2 is a vertical section. Fig. 3 is a transverse section on the line 1 2, Fig. 2; and Fig. 4 is a section on the line 3 4, Fig. 2.

A is a standard or frame having a sleeve, *a*, which is adapted to pass over a hollow mandrel, B. In this mandrel is a screw, C, and adapted to the threads of the screw is a nut, E, this nut being secured to the collar *a* of the standard A by a nut, *e*, adapted to the threaded portion *e* of the nut. The screw C is journaled in the inner end of the mandrel B and at the outer end in a cap, B', screwed upon the mandrel, the cap being confined to the screw by a fixed collar, *c*, and a movable collar, *c'*. The screw-shaft is provided with a suitable handle, C', by which the screw is turned and the standard A moved upon the mandrel.

Forming part of the mandrel B in the present instance is a screw-threaded stem, *b*, adapted to the threads on which is a thumb-nut, *b'*. On this stem *b* is a flange, *f*, a collar, *f'*, and a cone, *f*². The collar *f'*, I make of the same diameter as that of the bore of the pulley, and I slip the pulley into position, as shown by dotted lines in Fig. 2, then the cone, and then screw up the thumb-screw *b* until the pulley is firmly held in position upon the stem *b*; but it will be noticed that a space is left between the sleeve *f'* and the cone *f*², so that the drill or tap, described hereinafter, can pass through the hub of the pulley and make a clean hole without injur-

ing any portion of the machine or the drill or taps.

On the standard A slides a carriage, D, carrying the drilling mechanism, said carriage being adapted to undercut ways *d* in the standard A. Portions *d'* of this carriage bear against the sides of the standard A, so as to insure perfect steadiness in the travel of the carriage. The carriage is raised and lowered by means of a screw, G, journaled in the standard A and provided at its upper end with a handle, G'.

Adapted to the threads of the screw G is a nut, H, which passes through a slot, *h*, Fig. 2, in the rear of the standard A, and into a T-way in the carriage D, the shank *h'*, Fig. 4, of the nut being T-headed to correspond with this way. A set-screw, *h*², bears against the shank of the nut, preventing its moving independent of the carriage; but when it is desired to release the carriage from the control of the nut the set-screw is turned out of engagement with the shank *h'* of the nut.

The vertical screw-shaft feeds the carriage radially toward and from the hub of the pulley, so that by turning the screw-shaft C in one direction the drill will be moved toward the pulley, and by turning the screw-shaft G the drill will be fed radially toward the hub of the pulley.

The gearing for driving the drill is constructed in the following manner: The driving-spindle L has its bearings in the extension *l* on the carriage D, and to this spindle is attached the flexible driving-shaft, or, where driving-shafts are not used, a pulley may be secured to this spindle. On the inner end of the spindle is a bevel gear-wheel, 2, as shown in Fig. 4, engaging with a bevel gear-wheel, 3, on a vertical spindle, 4, having its bearings in the upper and lower casing of the carriage. On the vertical shaft 4 is a pinion, 5, engaging with a pinion, 6, this pinion in turn engaging with a pinion, 7, and the pinion 7 engaging with a pinion, 8. All these pinions have their bearings in the upper and lower frames of the carriage. The lower frame in this instance is detachable, so that on removing said lower frame all the gearing can be removed for repairs. The orifice in the pinion 8, I prefer to make tapered, so as to fit the

shank of the ordinary twist-drill, which is shown in position on said pinion. Thus it will be seen that this portable pulley-hub-drilling machine can be applied to a pulley in any position on the bench or floor, depending upon its size, and can be attached to said pulley very quickly and be in position to bore the necessary set-screw holes or oil-holes, as the case may be, without the necessity of the tedious operation of securing the pulley in a certain position, boring not only through the hub of the pulley, but also, in most cases, through the rim of the wheel, thus weakening it to a certain degree.

The machine will take in a number of sizes of pulleys, and by the simple adjustment of the two screw-shafts C and G, I am enabled to accommodate the machine to different sizes of pulleys.

A suitable tapping-tool is provided, and when it is required to tap the orifice after drilling I uncouple the carriage from the nut H by unscrewing the set-screw h^2 , so that it will be free from the feed-screw G, and when the tap is started it feeds itself into the orifice, and by uncoupling the flexible shaft (shown by dotted lines in Fig. 1) the tap can be reversed by hand by applying a suitable handle or wrench to the end of the driving-shaft L.

The cone f^2 is adapted to fit into the bore of a number of different-sized pulleys; but the sleeve or collar f' , I prefer to make to fit the different sizes, so as to have a firm bearing as nearly as possible under the drill. The flange f takes the thrust of the pulley, and, being accurately made, will insure the drilling of the hole in the proper line.

I claim as my invention—

1. The combination, in a pulley-hub-drilling machine, of the mandrel B, adapted to be secured to the hub of the pulley, and a screw-shaft in said mandrel, with a standard, A, carrying

the drill-carriage, and a nut detachably secured to said standard and meshing with the threads on the screw, substantially as described.

2. The combination of the mandrel carrying the drilling mechanism, having a screw-spindle, b , and a nut thereon, with a cone-sleeve on said spindle and acting with the mandrel to clamp the hub of the pulley to the frame, substantially as described.

3. The combination of the mandrel B, the screw-shaft C, sliding standard A, having a nut engaging with the screw-shaft C, said standard having guideways, and a carriage adapted to said guideways and provided with a nut, with a vertical screw-shaft in said standard engaging with the nut, so that by turning the shafts C and G the carriage may be moved both from or toward the pulley and from or toward the center of the pulley, substantially as described.

4. The combination, in a drilling and tapping machine, of the standard having a screw, and a nut adapted to the screw, with a drill-carriage adapted to be raised or lowered by said screw, and means for securing the carriage to and detaching it from the nut without disturbing either the nut or the carriage, substantially as set forth.

5. The combination of the standard A, screw-shaft G, and a nut, H, adapted to said screw, with a carriage, D, having a T-slot in which the shank of the nut H is confined, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FREDERIC SCHIOFF.

Witnesses:

HENRY HOWSON,
WILLIAM D. CONNER.