(No Model.)

# S. HÖNIÑGER.

## DRILLING MACHINE.

No. 380,486. Patented Apr. 3, 1888.

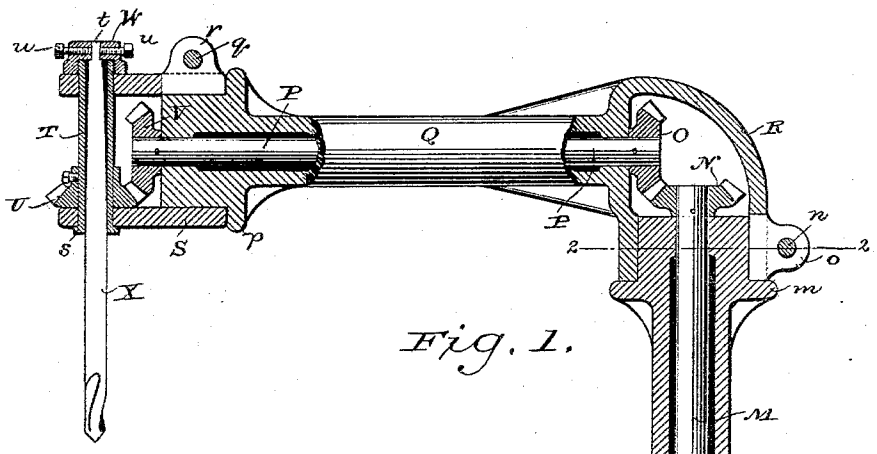


Fig. 1.

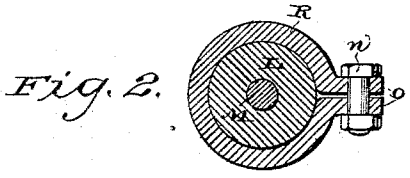


Fig. 2.

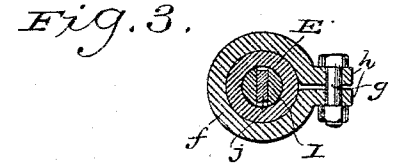


Fig. 3.

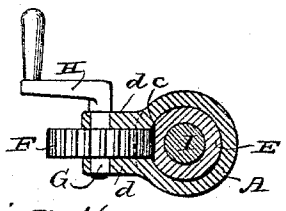
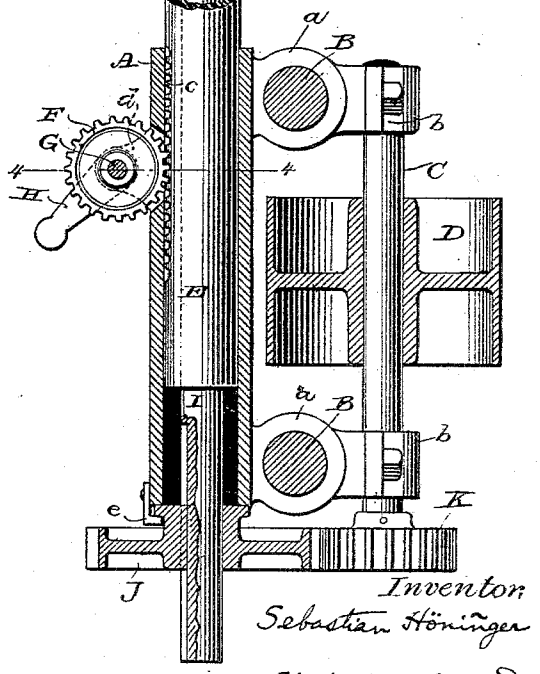


Fig. 4.



Witnesses
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# UNITED STATES PATENT OFFICE.

SEBASTIAN HÖNINGER, OF MILWAUKEE, WISCONSIN.

## DRILLING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 380,486, dated April 3, 1888.

Application filed January 26, 1888. Serial No. 261,966. (No model.)

*To all whom it may concern:*

Be it known that I, SEBASTIAN HÖNINGER, of Milwaukee, in the county of Milwaukee, and in the State of Wisconsin, have invented certain new and useful Improvements in Drilling-Machines; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to drilling-machines; and it consists in certain peculiarities of construction and combination of parts, to be hereinafter described with reference to the accompanying drawings, and subsequently claimed.

In the drawings, Figure 1 represents a sectional plan view of my invention and its application to a drilling-machine; and Figs. 2, 3, and 4, horizontal sections, respectively taken on lines 2 2, 3 3, and 4 4 of Fig. 1.

Referring by letter to the drawings, A represents a shell, provided with ears *a*, that slide on rods B and terminate in bearings *b* for a shaft, C, the latter carrying a belt-pulley, D. Arranged within the shell A is a sleeve, E, provided with rack-teeth *c* for engagement with a pinion, F, that has its shaft G journaled in brackets *d* on said shell, and provided with a crank, H. The sleeve E forms a bearing for a boring-shaft, I, and feathered on this shaft is a gear-wheel, J, that meshes with a pinion, K, on the shaft C, and is held against the adjacent end of the sleeve A by means of brackets *e* or other suitable means.

The parts thus far described being common in drilling-machines, their mutual relation and operation are too well known to need further description at this time.

As shown in Fig. 1, the split end *f* of a tubular section, L, is slipped onto the forward end of the sleeve E and made fast by a clamping-bolt, *g*, passed through lugs *h* on said split end of the tubular section, the latter being also provided with a shoulder, *i*, for impingement against said sleeve. The tubular section L may be of any desirable length, and serves as a bearing for an extension, M, of the boring-shaft I, the latter being provided with a recess in its forward end to receive a tang, *j*, on the adjacent end of said extension, and the connection thus formed is made tight by a countersunk set-screw, *k*, to which access may be had through an opening, *k'*, in said section and the sleeve E, as illustrated in Fig. 1. The free end of the boring-shaft extension M projects beyond the tubular section L, and to this projecting end of said extension is keyed a bevel gear-wheel, N, that meshes with a similar wheel, O, on the adjacent end of another extension, P, of the boring-shaft, the latter extension being at right angles to the former and having its bearings in a tubular bracket, Q, that has the rear end thereof in the form of a split housing, R, said bracket being of any desirable length.

The split housing R, forming part of the bracket Q, is slipped onto the forward end of the tubular section L, and is supported by an annular flange, *m*, on said section, said housing being made fast by a clamping-bolt, *n*, passed through lugs *o* on the split portion thereof. The tubular bracket Q near its forward end is also provided with an annular flange, *p*, that serves as a stop for a split shell, S, that is slipped onto said end of the bracket and held in place by a clamping-bolt, *q*, passed through lugs *r* on said shell. A sleeve, T, is passed transversely through the shell S, and has keyed thereto a bevel gear-wheel, U, that meshes with a similar wheel, V, on the adjacent end of the boring-shaft extension P.

On one end of the sleeve T is a flange, *s*, that comes against the shell S, and the other end of said sleeve engages with a screw-threaded cap, W, that also impinges against said shell. The cap W is provided with a recess to receive the tang *t* of a drill, X, and the connection thus formed is made tight by set-screws *u*, as illustrated in Fig. 1.

In ordinary drilling-machines the drill can only operate in one direction and the work has to be turned about to bring different sides thereof in position to be acted upon; but by the organization of parts as shown in Fig. 1 the work can be operated upon from the rear side, or the tubular bracket Q and the shaft P may be removed and the shell S arranged on the forward end of the tubular section L to bring the gear-wheel U into mesh with the one, N, on the extension M of the boring-shaft I, and the parts being in this arrangement the drill will work at right angles to said shaft. The tubular section L being detachably connected to the sleeve E, the several parts di-

rectly and indirectly connected to the latter may be readily removed as one piece and a drill connected to the shaft I to operate in the usual manner.

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

1. In a drilling-machine, the combination of the boring-shaft I and its sleeve E, a tubular section, L, connected to the sleeve, an extension, M, rigidly connected to the shaft and having its bearings in said sleeve, a shell, S, for connection with said tubular section, a sleeve, T, transversely arranged in the shell, suitable gearing for connecting the shaft extension and last-named sleeve, and a drill rigidly connected to this latter sleeve, substantially as set forth.

2. In a drilling-machine, the combination of the boring-shaft I and its sleeve E, a tubular section, L, connected to the sleeve, an extension, M, rigidly connected to the shaft and having its bearings in said sleeve, a tubular bracket, Q, connected to the tubular extension of the sleeve and extending at right angles therefrom, another extension, P, of the shaft, arranged in the bracket and geared to the first-named shaft-extension, a shell, S, connected to the bracket, a sleeve, T, transversely arranged in the shell and geared to the right-angular extension of said shaft, and a drill rigidly connected to this latter sleeve, substantially as set forth.

3. In a drilling-machine, the sleeve E, shaft I, tubular section L, shaft-extension M, and gear-wheel N, in combination with the shell S, sleeve T, gear-wheel U, cap W, and drill X, all arranged to operate substantially as set forth.

4. In a drilling-machine, the sleeve E and shaft I, in combination with the tubular section L, shaft-extension M, and gear-wheel N, the tubular bracket Q, provided with the housing R, the shaft-extension P, gear-wheels O and V, shell S, sleeve T, gear-wheel U, and drill X, carried by the latter sleeve, all arranged to operate substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand, at Milwaukee, in the county of Milwaukee and State of Wisconsin, in the presence of two witnesses.

SEBASTIAN HÖNINGER.

Witnesses:
N. E. OLIPHANT,
WM. KLUG.