2 Sheets—Sheet 1.

J. S. SWARTLEY.

Stone-Drill.

No. 219,128. **Patented Sept. 2, 1879.**

Fig. 1.

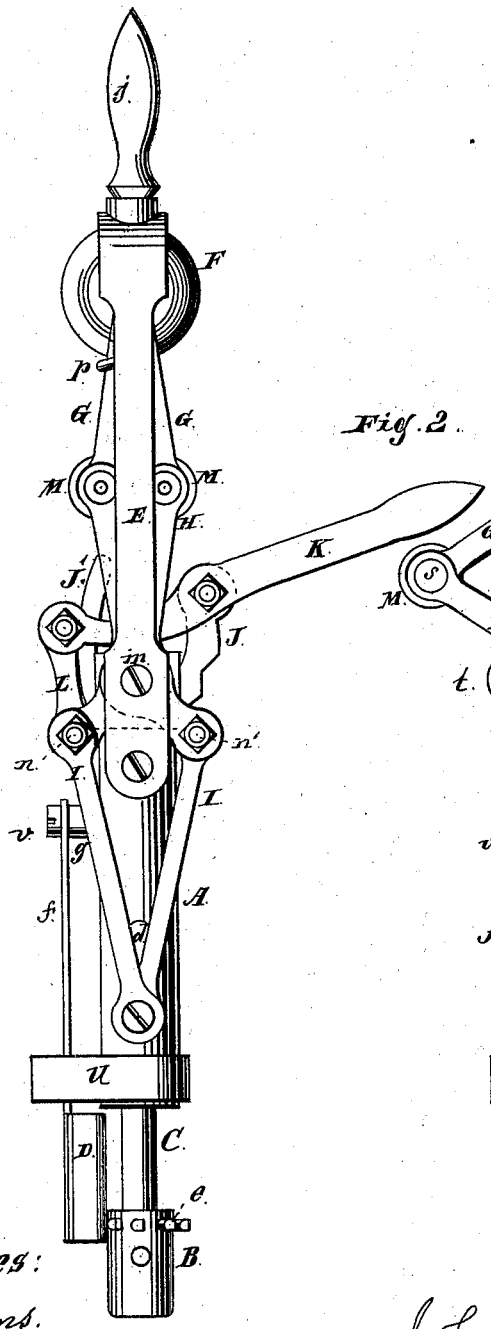


Fig. 2.

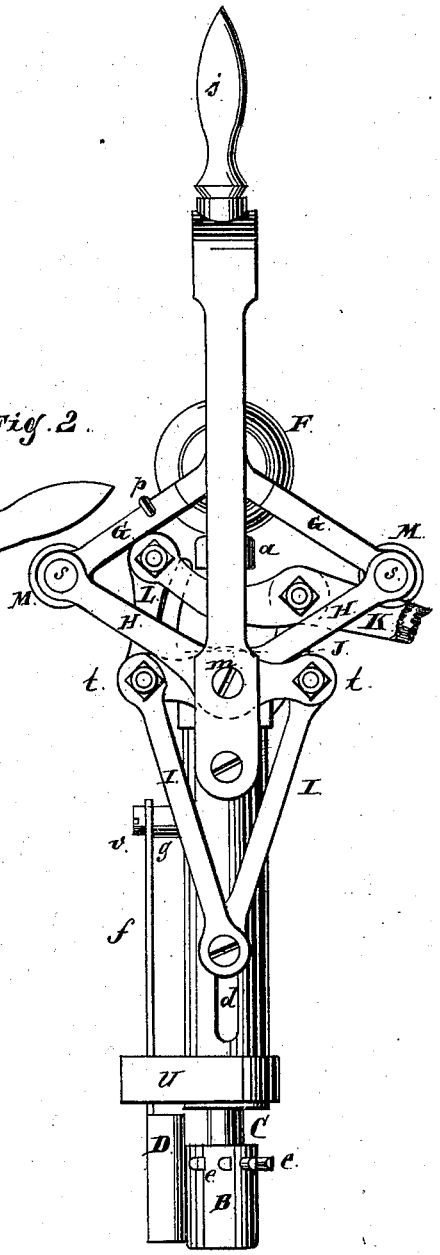
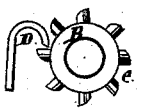


Fig. 3.



Witnesses:

H. L. Burns.

O. W. Bond.

Inventor:

John S. Swartley.

By West & Bond Attys.

J. S. SWARTLEY.
Stone-Drill.

No. 219,128. Patented Sept. 2, 1879.

Fig. 4.

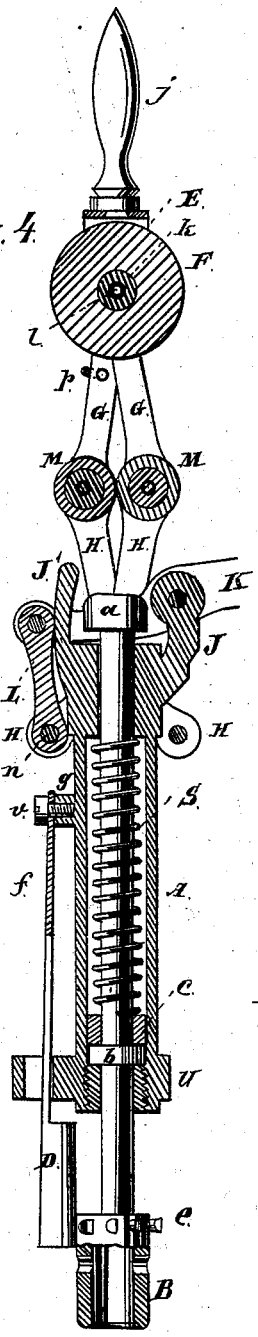


Fig. 5.

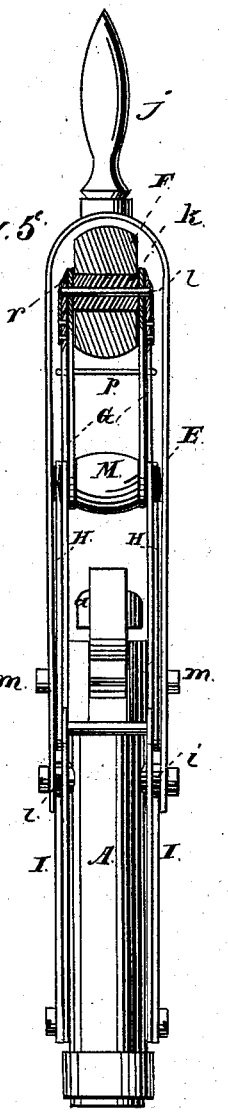


Fig. 10

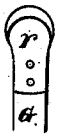


Fig. 9.

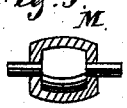


Fig. 8.

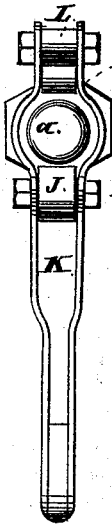
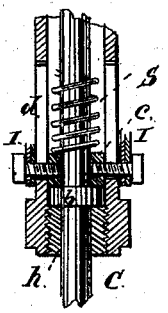


Fig. 6.



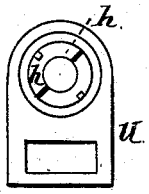


Fig. 7.

Witnesses:
H. L. Bruns
C. W. Bond.

Inventor:
John S. Swartley
By Hoyt & Pond Atys.

UNITED STATES PATENT OFFICE.

JOHN S. SWARTLEY, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN STONE-DRILLS.

Specification forming part of Letters Patent No. **219,128**, dated September 2, 1879; application filed May 6, 1879.

To all whom it may concern:

Be it known that I, JOHN S. SWARTLEY, of Chicago, Cook county, State of Illinois, have invented new and useful Improvements in Stone-Drills, of which the following is a full description, reference being had to the accompanying drawings, of which there are two sheets, in which—

Figure 1 is a side elevation. Fig. 2 is the same, the position of the parts being changed as when in use. Fig. 3 is a detail, being an end view of the tool-holder and pawl. Fig. 4 is a vertical section. Fig. 5 is an elevation, looking to the right of Fig. 1. Figs. 6, 7, 8, 9, and 10 are details, Fig. 8 being a top view of the lever K in place.

The object of this invention is to provide a rock-drill which can be easily and efficiently operated by hand. Some of the leading parts of the instrument are constructed in the same manner as dental pluggers now in use; but material additions and modifications are required.

In the drawings, A represents a tubular handle or case. B is the tool-holder, the shaft of which, C, extends up through A. *a* is a removable cap or head on the upper end of the shaft or drill-rod C, which, when worn, can be replaced. *b* is a fixed shoulder or collar on C. *c* is a loose collar on C, just above *b*. *d d* are slots in A. *e* are pins or ratchet-teeth on the tool-holder B. D is a pawl engaging with *e*. This pawl is connected to a spring-bar, *f*, the upper end of which is secured to a stud, *g*, on one side of A.

The opening in the lower end of A is large enough to receive the collar and shoulder *c b*; and *h* is a divided nut, which has a screw-thread on the outside, and is inserted in place after the drill-rod C has been inserted in A. This nut forms a shoulder for *b* to rest on. S is a coil-spring around C.

E is a metal strap, the two ends of which are secured upon or to studs *i i*, one on each side of A. *j* is a handle on the top of E.

F is a metal hammer or ram, as shown. It is a ball which rotates. *k* is a rubber bushing in F, through which the pin *l* passes.

G are four arms, pivoted at their upper ends on the pin *l*, two on each side.

H are four levers. They are fulcrumed on screws or pins *m*, which pass through E into A. The upper ends of these levers are pivoted to the lower ends of the arms G, and their lower ends to the arms I, which arms I are pivoted at their lower ends to the collar *c* by means of screws or pins, which pass through the slots *d* in A.

J J′ are two arms on opposite sides of A, and permanently secured thereto. K is a lever, which is fulcrumed at the top of the arm J. The short arm of this lever is pivoted to the upper end of a short connecting-bar, L. The lower end of this bar L is hinged upon a pin, *n*, which passes through two of the levers H and through two of the arms I, as shown in Figs. 1 and 4. The other two arms I and levers H are pivoted on a corresponding pin, *n′*. (See Fig. 5.)

M are bumpers, of rubber or other suitable material, on the pins, to which the lower ends of G and upper ends of H are pivoted. *p* is a link or bent rod, which prevents the arms G from spreading apart. *r r* are thin plates, secured upon the outside of the two outer arms, G, and over the holes for the pin *l*, keeping the mallet F in the center, and preventing its lateral movement.

Two of the four levers H and two of the four arms I are on one side of the instrument, and two on the opposite side. The lower ends of G and the upper ends of H are connected by pins *s s*, to which they are pivoted, and the lower ends of the levers H and the upper ends of the arms I are similarly connected and pivoted at *t t*. (See Fig. 2.)

The levers being connected with the case A at *m*, and the lower ends of the arms I being connected with the collar *c* on the drill-rod C, and the remaining parts being as described, the case can move up and down over the rod C.

The operation is as follows: A suitable drill is to be inserted in B. The operator will hold the instrument in the left hand, taking hold of the handle *j*, and will grasp the lever K with the right hand and place the drill in the desired position on the stone to be drilled; then the several parts of the instrument will be in the position shown in Fig. 1, the case A being forced up and held by the action of the spring S. Then by quickly pressing down the lever

K the parts will be brought into the position shown in Fig. 2, and a blow will be struck by the hammer F on the top of the drill-rod, the case A having been carried down over the rod C. Then the case A and the parts connected therewith can be turned a little by pushing the lever K from the operator, the rod C remaining stationary, carrying the pawl D past one or more of the ratchet-teeth *e* on B, the spring-arm *f* causing the pawl to engage with such teeth after passing over them. Then by turning the case back the rod C and drill or other tool in B will rotate, bringing such drill into another position. At the same time, by lifting on the lever K, or by the handle *j*, or both, and by the action of the spring S, the parts will be returned to the position shown in Fig. 1, ready for another stroke.

The case and hammer can also be forced down by pressing down on the handle *j*.

The instrument can be operated rapidly. It might be operated by power, instead of by hand, through suitable mechanism connected with K.

The lower ends of Figs. 1 and 2 should be on the same level.

The rubber in the hammers and the bumpers M have a tendency to relieve the concussion.

The arm J′ is located between the fork of the short arm of the lever K, and is designed to relieve the parts from strain while rotating the case.

The pawl D and spring-arm *f* may be constructed from a single piece of suitable metal. The arm *f* passes through a guide, *u*. The tension of this spring-arm *f* can be adjusted by a screw, *v*.

The drill-stock C can rotate in the nut, in the bearing at the top of the case, and in the loose collar *c*; or the case can rotate around the stock.

In manufacturing, the so-called fixed collar *b* may be simply an enlargement of C, the two parts being made from a single piece of metal.

The strap E may be regarded as a handle.

It is desirable to locate the lever K between the levers H; but it might be outside thereof. There the strain would be greater and the action less satisfactory.

What I claim as new, and desire to secure by Letters Patent, is as follows:

1. The combination of the case A, drill head and stock B C, and spring-pawl D, substantially as specified.

2. The case A, in combination with the drill head and stock B C, fixed collar or enlargement *b* on C, loose collar *c*, and divided nut *h*, substantially as specified.

3. The case A, provided with the arms J J′, in combination with the lever K and drill-stock C, substantially as and for the purposes specified.

4. The case A and drill-stock C, in combination with the strap or handle E and lever K, substantially as specified.

5. In a stone-drill, the hammer F, provided with a rubber or other suitable elastic bushing, substantially as specified.

6. In a stone-drill, rubber or other suitable elastic bumpers M, constructed and arranged substantially as and for the purpose set forth.

7. In a stone-drill, the connecting rod or link *p*, in combination with two of the arms G, substantially as specified.

8. In a stone-drill, the caps *r*, in combination with the arms G and hammer F, substantially as and for the purpose set forth.

9. The removable cap *a*, in combination with the drill-rod C, substantially as and for the purpose set forth.

10. The combination of the case A, drill head and stock B C, pawl D, arms G, levers H, arms I, strap or handle E, lever K, and hammer F, substantially as and for the purposes set forth.

11. The case A, provided with arms J J′, and the drill-rod C, in combination with the arms G, levers H, arms I, and connecting bar or link L, and lever K, substantially as and for the purposes set forth.

JOHN S. SWARTLEY.

Witnesses:
E. A. WEST,
O. W. BOND.