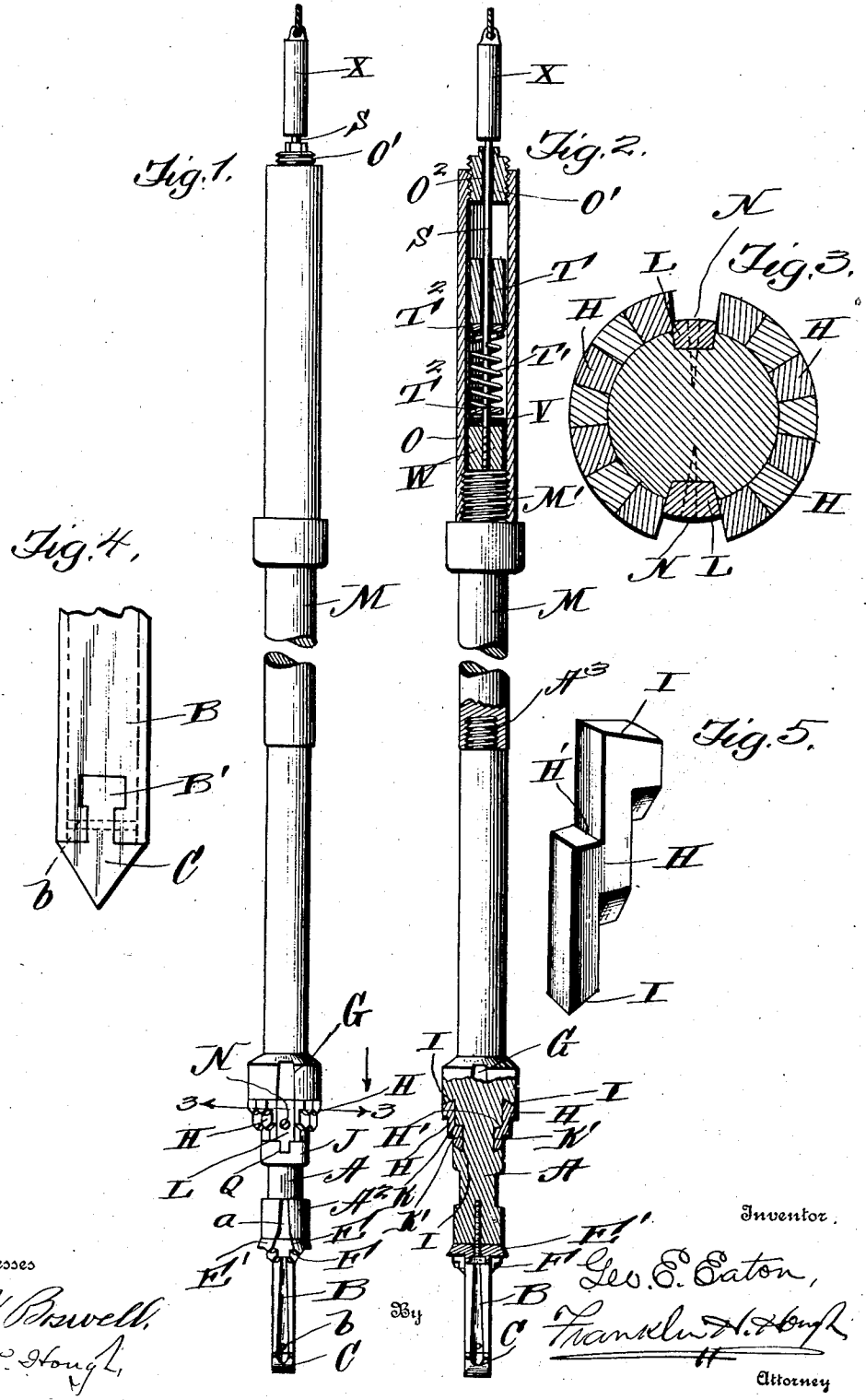
No. 839,824. PATENTED JAN. 1, 1907.

G. E. EATON.

DRILL.

APPLICATION FILED MAY 23, 1906.



Witnesses

R. A. Boswell.

C. E. Hough.

Inventor.

Geo. E. Eaton,

By Franklin H. Hough

Attorney

UNITED STATES PATENT OFFICE.

GEORGE E. EATON, OF CORNING, NEW YORK.

DRILL.

No. 839,824. Specification of Letters Patent. Patented Jan. 1, 1907.

Application filed May 23, 1906. Serial No. 318,427.

To all whom it may concern:

Be it known that I, GEORGE E. EATON, a citizen of the United States, residing at Corning, in the county of Steuben and State of New York, have invented certain new and useful Improvements in Drills; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to new and useful improvements in drills; and the object of the invention is to produce a simple and efficient device of this nature in which means is provided for gradually increasing the size of the hole being drilled by the provision of a plurality of drills of different diameters arranged tandem.

The invention consists, further, in the provision of a drill having a chambered portion in which weighted members are mounted upon a spring-actuated rod, whereby the strain coming upon the cables for hoisting the drill may be relieved and the starting of the drill incident to the recoil of the spring assisted.

The invention consists, further, in various details of construction and combinations and arrangements of parts, which will be hereinafter fully described and then specifically defined in the appended claims.

My invention is illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of my improved drill. Fig. 2 is a longitudinal sectional view. Fig. 3 is a detail sectional view on line 3 3 of Fig. 1. Fig. 4 is a side elevation showing the manner in which the drill-point is held in place, and Fig. 5 is a detail view of one of the drill-shoes.

Reference now being had to the details of the drawings by letter, A designates a drill-head having a contracted drill-holding member B, the end of which is recessed to receive a drill-point C, the shank portion of which is contracted and provided with a square end B′, adapted to fit a correspondingly-shaped recessed portion within the member B, and a pin *b* is passed through the grooved walls of the member B and also through the shank portion of said drill-point, whereby the same may be further securely held in place. Said head has formed therein grooves *a* at positions diametrically opposite, which grooves flare outwardly toward the drill-point and are in registration with grooves E, formed in the marginal edge of the drill-shoe E′, which latter has teeth F projecting from one face thereof, and grooves G are formed at positions diametrically opposite each other in said head to receive locking-plates L, and an annular recess receives a series of drill-shoes H, removably held therein. Each of said drill-shoes H, a detail of one of which is shown in the drawings, is provided with a series of steps, each of which is formed into a cutting edge, and the under surface of each shoe has a recess H′, adapted to fit over a shoulder K, formed in the annular recess K′. The ends of the shoes, it will be observed, each has an inclined portion I, adapted to engage undercut surfaces in the walls of the recess in which they are seated. At positions diametrically opposite each other are grooves Q, formed in the head and in the shoulder over which the recesses of the shoes engage, and said locking-plates L are seated in said grooves Q and grooves H, formed in alinement with the latter and held to the head by means of shoes N. In adjusting the shoes in place they are first inserted in the recess Q and then moved laterally with their inclined ends engaging the overhanging ends of the inclined surface of the recess, and after the plates have been fastened to the head said shoes will be securely held together. One end of said head has a contracted threaded part A^3, adapted to engage the stem M, which at its other end is provided with a threaded portion M′, adapted to screw within the tubular socket member O. A plug O′ is fitted in one end of said socket member and is provided with a central aperture O^2, through which a rod S has a longitudinal play. Mounted upon said rod and within the member O is a weighted member T, through which the rod has a play, and T′ designates a coil-spring having heads T^2, which are apertured to receive said rod, and W designates a second weighted member, which has a threaded aperture and adapted to fit the threaded end of said rod and serves the double purpose of a bur and weight. A rubber buffer V is fixed to one end of said burr and is adapted to cooperate with the spring in forming a cushion

for the purpose of taking up strain incident to the pull upon the rod in raising the drill. To the outer end of the rod is secured a weighted member X, to which connection may be had with a cable or other hoisting means.

In operation as the drill descends the weighted members coming against the spring will cause the same to yield, and the rebound of the weights upon the withdrawing of the drill will have a tendency to relieve the cable of strain, and by the provision of the drills shown and described a hole of small diameter is first formed, after which the following drills of increasing diameters will chip off the sides of the small hole, gradually enlarging the same, thereby greatly facilitatng the drilling of holes of considerable size, rendering it possible to drill a larger hole by the utilization of the series of drills than would be the case if a drill of a single diameter were utilized.

What I claim is—

1. A drill comprising a stepped head, a drill-point fixed to the latter, said head having an annular recess, the ends of which are undercut, a series of stepped drill-shoes mounted within said recess, and means for holding the same in place, as set forth.

2. A drill comprising a stepped head, a drill-point fixed to the latter, said head having an annular recess, the ends of which are undercut, a series of stepped drill-shoes mounted within said recess, and detachable plates designed to hold said stepped drill-shoes upon the head, as set forth.

3. A drill comprising a stepped head with grooves formed transversely across the steps of the latter, a drill-point fixed to said head, the latter having an annular recess formed therein, the ends of which are undercut, a series of stepped drill-shoes mounted within said recess, and detachable plates countersunken in said grooves and adapted to hold said drill-shoes in place, as set forth.

4. A drill comprising a stepped head having a drill-point, said head having an annular recess with undercut end walls, with the bottom of the recess provided with a shoulder, a series of stepped drill-shoes, the under surfaces of which are recessed and adapted to fit over said shoulder, said drill-shoes having inclined ends designed to engage the undercut end walls of said recess for holding the drill-shoes in place, as set forth.

5. A drill comprising a stepped head with grooves formed transversely across the stepped portions thereof and provided with an annular recess with a shoulder in the bottom of said recess, the end walls of said recess being undercut, a drill-point, a series of stepped drill-shoes, the under surfaces of which are recessed and adapted to fit over said shoulder, said drill-shoes having inclined ends engaging the undercut end walls of said recess, and detachable plates countersunken in said grooves in the head and designed to hold the drill-shoes in place, as set forth.

6. In combination with a stepped drill-head provided with longitudinal grooves at positions diametrically opposite and an annular recess with undercut end walls, a drill-point, a series of drill-shoes seated in said recess and held by said undercut end walls of the recess, said drill-shoes having series of cutting-points in concentric circles, and means engaging said grooves for holding said stepped shoes against lateral movements, as set forth.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

GEORGE E. EATON.

Witnesses:
DATON GILBERT,
M. L. SAGE.