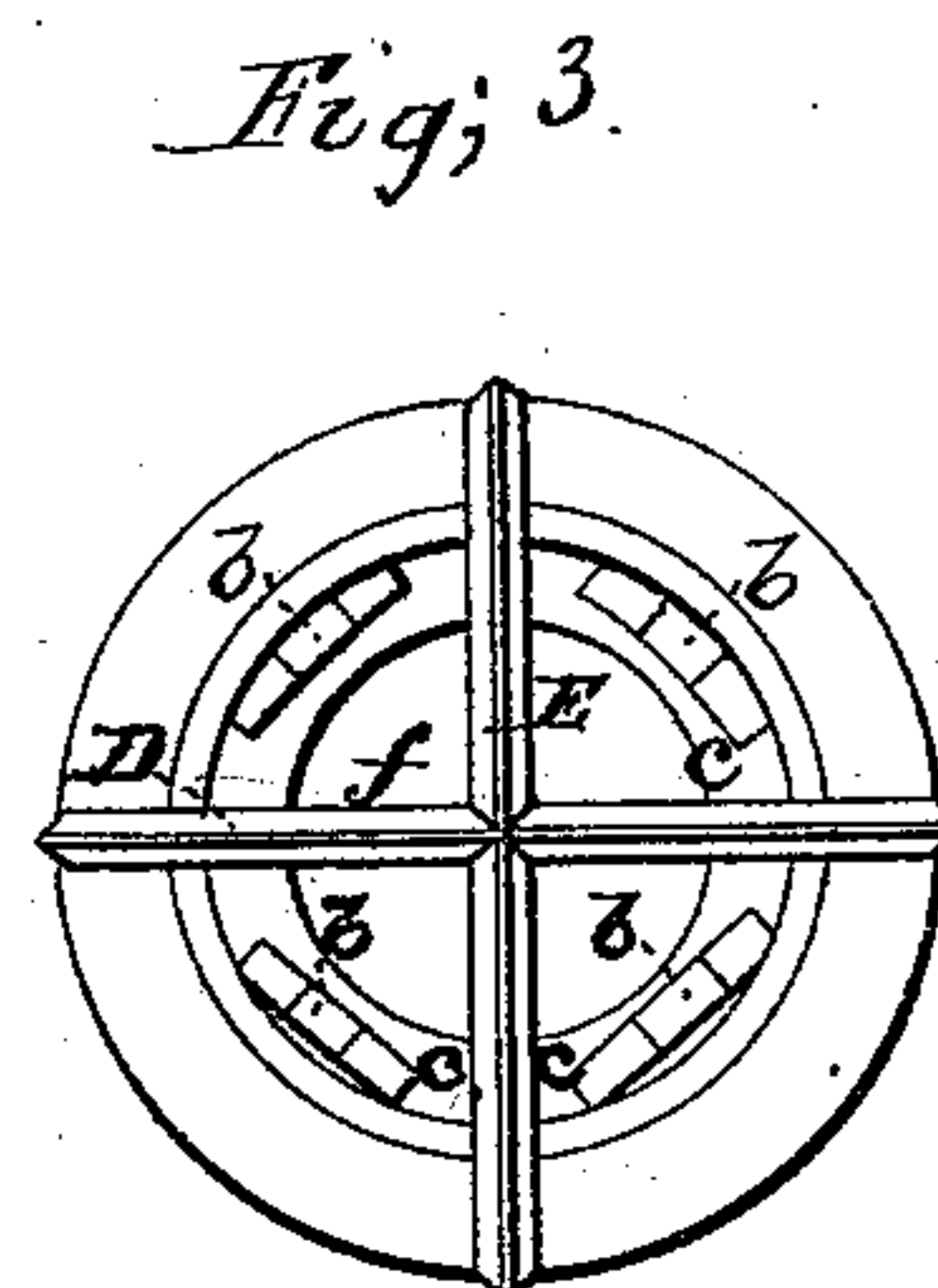
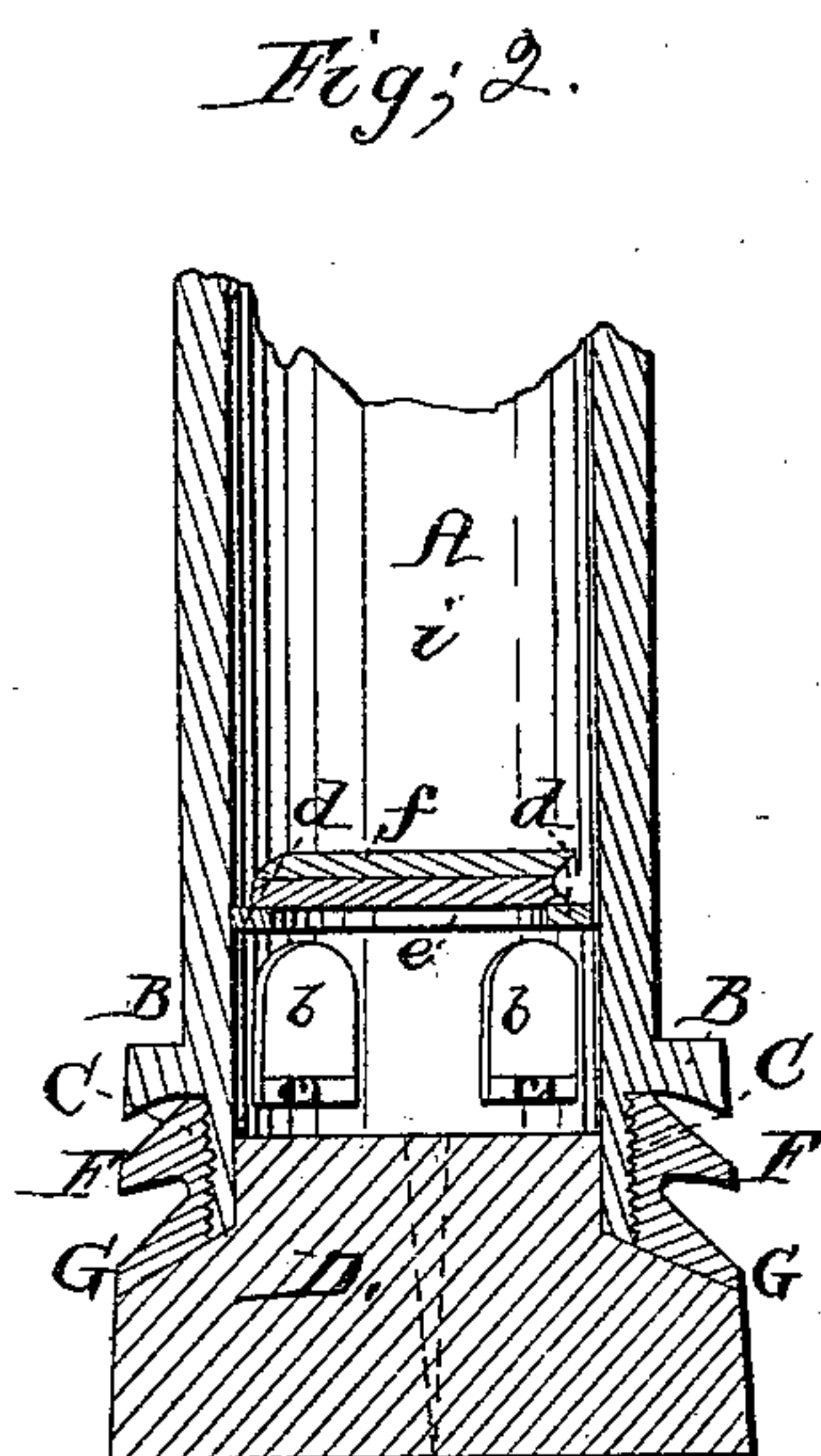
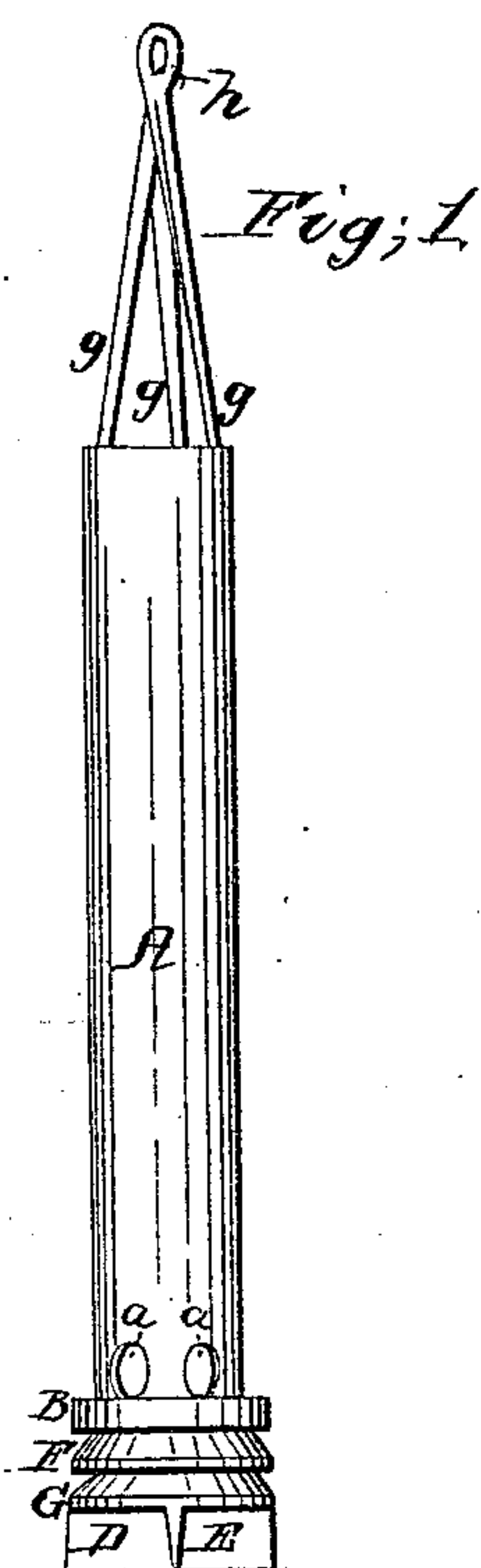


*W. Higgins,
Rock Drill.*

No 3,071.

Patented May 2, 1843.



UNITED STATES PATENT OFFICE.

URIAH HIGGINS, OF BOSTON, MASSACHUSETTS.

DRILL FOR DRILLING OR BORING ROCK, &c.

Specification of Letters Patent No. 3,071, dated May 2, 1843.

To all whom it may concern:

Be it known that I, URIAH HIGGINS, of Boston, in the county of Suffolk and State of Massachusetts, have invented a certain new and useful instrument or apparatus to be used for drilling or boring through rock or hard earth during the operation of sinking Artesian wells, and that the following specification, taken in connection with the accompanying drawings, constitutes a full and exact description thereof.

Figure 1, of the drawings above mentioned, represents an external elevation of my improved tool or instrument. Fig. 2 is a vertical and central section of the lower end thereof, and Fig. 3 is a view of its lower end.

A Figs. 1, 2, 3, is a long metallic tube, having a diameter externally somewhat less than that of the hole intended to be drilled, and a collar or flanch B and a screw C, formed upon its outer surface at the lower end thereof, as seen in the drawings. Steel chisels or cutters D, E, crossing each other, are strongly secured in any proper manner to the lower end of the tube A, the length of these chisels being somewhat greater than the diameter of the flanch B. Other flanches F, G, of hardend steel are screwed upon the tube A, between the chisels and the flanch B, the object of the movable flanches F and G, each of which is somewhat greater in diameter than the flanch B, being to serve as guides to the instrument during its vertical movements, and to prevent wear of the flanch B and ends of the cutters D, E. Just above the flanch B any suitable number of holes *a, a*, (two of which are represented in Fig. 1,) are bored through the tube A, each of which is provided with a valve *b*, as seen in Figs. 2, 3, the valves being arranged in the interior of the tube, and playing on hinges *c, c*, at their lower ends. Directly over the series of valves above mentioned a partition *d, d*, Fig. 2, extends across the interior of the tube, the said partition having an orifice or passage *e* formed through it, which is covered by a foot valve *f*, which is arranged on the upper side of the horizontal partition *d, d*, and opens upward.

The apparatus thus constructed is suspended to the rope which connects with the

drill spring, which is generally used, by means of three or more rods *g, g, g*, Fig. 1, extending from its upper end and uniting in an eye *n*.

As the drills ordinarily used in excavating through rock are generally composed of a chisel or cutting edge formed upon the extremity of a rod of metal, they are continually subjected, at every downward blow, to the inconvenience of an immense resistance, resulting from the pulverized mass of rock, which the drill detaches from time to time, this resistance increasing with the quantity of rock displaced, so that in fact the drill not only removes portions of rock from the ledge in which the hole is bored, but is continually working against the detached particles and cutting them over and over. This renders the operation of drilling rocks very tedious and slow, particularly after the drill has sunk to a considerable depth below the surface.

My instrument, which is intended to obviate the difficulties above mentioned, is raised up and down in the hole in the same manner as the ordinary drill is operated. When it descends small fragments of the rock are removed, by the chisels D, E, and as the hole bored is generally filled with water, the fragments thus removed will rise through the orifice *e*, into the chamber *i* or that part of the interior of the body of the tube A which is situated above the valve *f*. When the tube is elevated the valve *f* closes and prevents the return of the particles, and the water which may be above the shelf or flanch B, pressing upon the valves *b, b*, rushes through the orifices *a, a*, and communicates freely with the water beneath the valve *f*. The operatives are thus enabled to raise and depress the instrument without experiencing any material resistance from water, and also to remove the detached portions of rock from the space beneath the cutters as fast as any quantity thereof accumulates therein. When the chamber *i* has become filled with loose rock or earth, the instrument may be hoisted out of the hole and the particles discharged from it. By an apparatus of my improved construction, the process of drilling is greatly facilitated.

Having thus explained my invention, and set forth the principles thereof by which it

may be distinguished from others of like character, I shall now proceed to point out such parts as I claim.

I claim—

- 5 1. The above method of constructing a drill, that is to say, by forming the same of a long tube, with cutters and valves applied to its lower end, the whole being arranged and operating substantially in the manner
10 hereinbefore described.

2. I also claim the movable collar pieces or flanches F, G, as combined with the tube

and cutters, for the purpose of arresting the wear thereof, the same being adapted thereto substantially as herein before represented. 15

In testimony that the foregoing is a true description of my said invention and improvements I have hereto set my signature this fourth day of March in the year eighteen hundred and forty-three.

URIAH HIGGINS.

Witnesses:

R. H. EDDY,
EZRA LINCOLN, Jr.