

G. FRISBEE.
Rock-Drills.

No. 153,674.

Patented Aug. 4, 1874.

Fig. 1

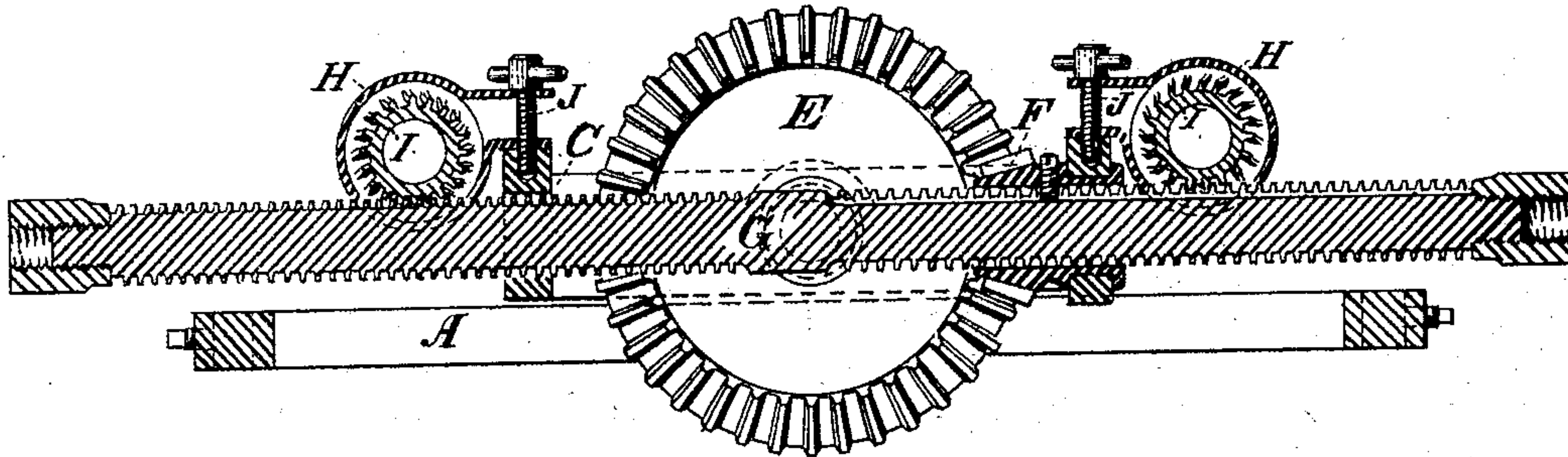


Fig. 3

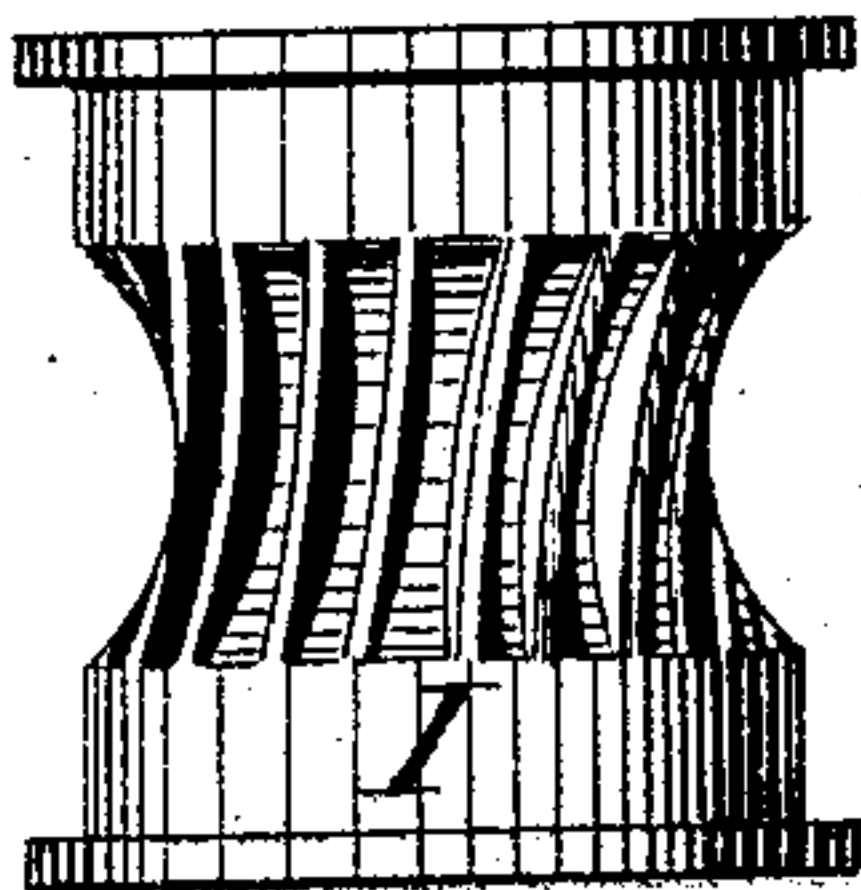


Fig. 4

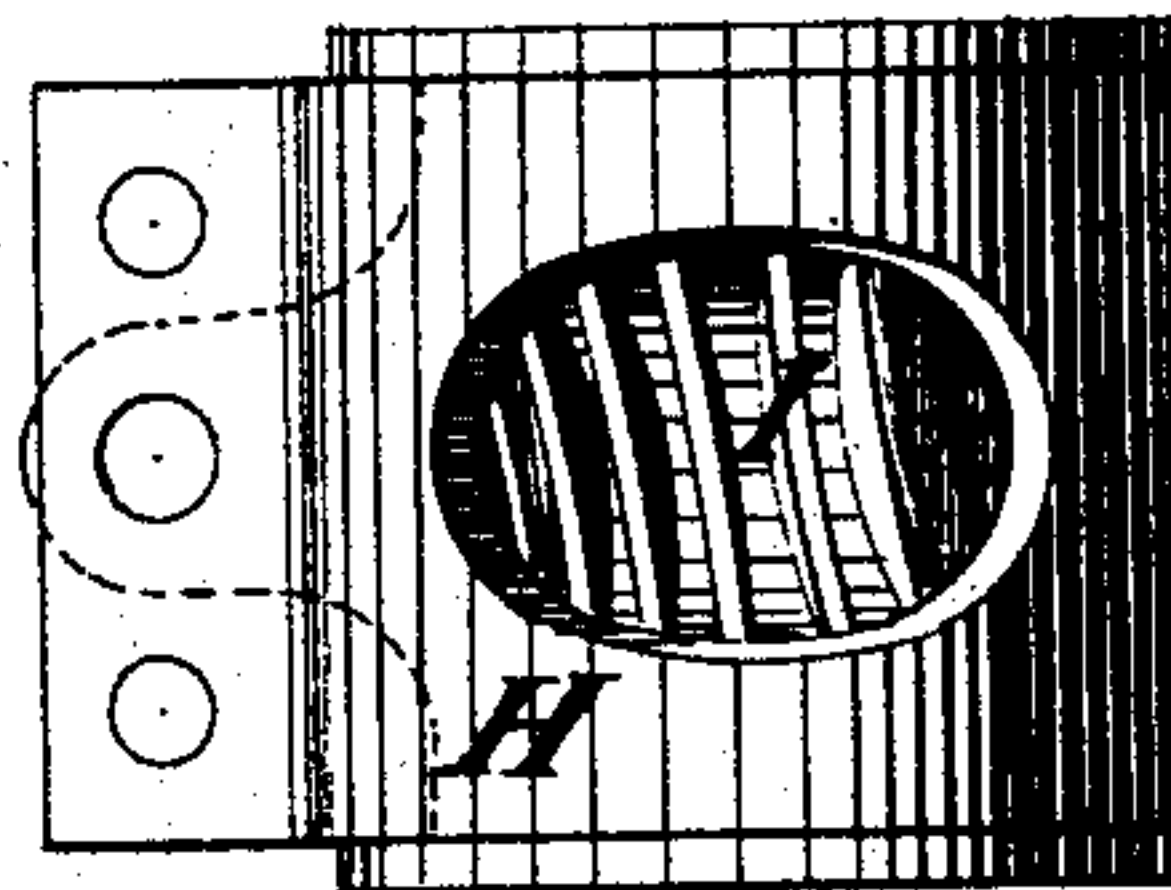
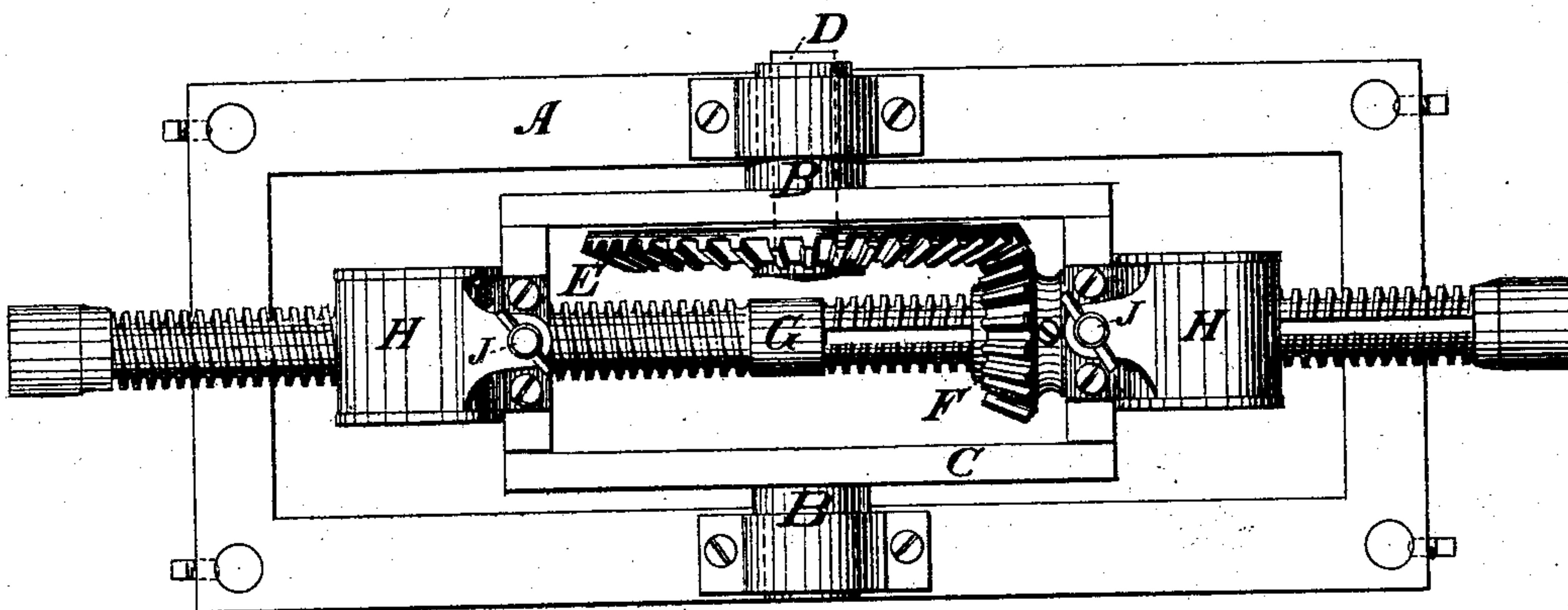


Fig. 2



Witnesses:

Geo. Overding
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UNITED STATES PATENT OFFICE.

GIDEON FRISBEE, OF READING, PENNSYLVANIA.

IMPROVEMENT IN ROCK-DRILLS.

Specification forming part of Letters Patent No. **153,674**, dated August 4, 1874; application filed July 20, 1874.

To all whom it may concern:

Be it known that I, GIDEON FRISBEE, of Reading, in the county of Berks and State of Pennsylvania, have invented a new and useful Improvement in Rock-Drill; and I do hereby declare the following to be a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the said invention, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a longitudinal section of the said improvement taken through the axis of the drill-spindle; Fig. 2, a plan thereof; and Figs. 3 and 4, enlarged views of detached portions of the same, part of the band in Fig. 4 being removed to show the wheel within.

The same parts are denoted by the same letters in all the figures.

This invention relates to the mechanism employed for feeding the bit of a revolving rock-drill against the rock; and also to the means whereby such drill is withdrawn from the excavation.

It consists, first, in the combination, with the ordinary screw-shaft or drill-spindle, of a worm-wheel and friction-band; and, secondly, in the combination of a drill-spindle made with a right-and-left-hand screw, two worm-wheels meshing with said screws, and two friction-bands, all these devices being constructed and operating as hereinafter explained.

A in the drawing represents the frame of an open cut or quarry drill, which is supported in the usual manner, and to which is pivoted, by trunnions B B, the inner frame C which carries the drilling machinery. D is a shaft, (shown in dotted lines in Fig. 2,) which passes through one of the trunnions, and is revolved by any suitable power. To this shaft is keyed the bevel driving-gear E, meshing with the sleeve-pinion F, which is supported by the frame C, and in which the drill-spindle G is feathered, so as to be capable of longitudinal motion within F, and also to be revolved by the rotation thereof. The left-hand portion of the spindle, as shown in the drawing, is made with a right-hand screw, and the right-hand portion with a left-hand screw. To

either end of the frame C is secured an elastic band, H, within which is a worm-wheel, I, whose teeth mesh with the right or left hand screw on the drill-spindle, as the case may be. This part of the face of the wheel on either side of the teeth is smooth, as shown in Fig. 3. The wheel is inclosed by the band H, one end of which is fastened to frame C, while through the other end passes a screw, J, working in said frame, and provided with a thumb-nut or hand-wheel at its upper end by which the pressure of the elastic band H on the smooth portions of the face of wheel I is regulated. The band H is made preferably of spring steel. Instead of a single band two narrow bands may be employed, bearing on the wheel I on either side of the teeth. The face of the wheel I is sunk so as to leave a narrow collar at each end, by which it is kept in the band.

In operation the spindle G advances to the right, and, in order to feed it forward, the screw J is tightened on that one of the bands, H, which incloses the worm-wheel that meshes with the left-hand screw. The band is thus made to act as a brake, and, should it be tightened enough to stop the revolution of the wheel altogether, the teeth of said wheel would act as a nut to feed the spindle forward. As the pitch of the thread, however, would in most cases render this feed too rapid, the screw J is only tightened enough to cause the wheel to turn hard, which will feed the bit against the rock with a slow movement of progression. This gives an elastic feed, which may be increased or diminished while the machine is in motion, and permits the rate of penetration to be determined by the hardness of the rock, the feed being retarded when the resistance is increased by the bit striking a harder rock, and accelerated in soft rock. While the drill is being fed forward the brake H on the wheel which meshes with the right-hand screw is left loose, so that the wheel can turn freely; but when it is desired to withdraw the drill without stopping the machine the brake on the left-hand-screw worm-wheel is loosened, and that on the opposite wheel is tightened, whereby the spindle is run back without reversing its movement of rotation. In boring deep holes, when the weight of the

rods is more than sufficient to feed the drill downward, the brake on the right-hand screw worm-wheel is tightened, so as to relieve so much of the weight as may be desired.

What I claim as my invention, and desire to secure by Letters Patent of the United States, is—

1. The combination, with the screw-spindle of a revolving rock-drill, of a worm-wheel, I,

and band H, operating to feed the drill, substantially as shown and described.

2. The combination, substantially as shown and described, of the drill-spindle G, made with a right-and-left-hand screw, the worm-wheels I L, and the bands H H.

Witnesses: GIDEON FRISBEE.

HENRY O. RUSSEL,

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