(No Model.)

T. HERBERG.

EXPANDING DRILL BLADE.

No. 414,411. Patented Nov. 5, 1889.

Fig. 1.

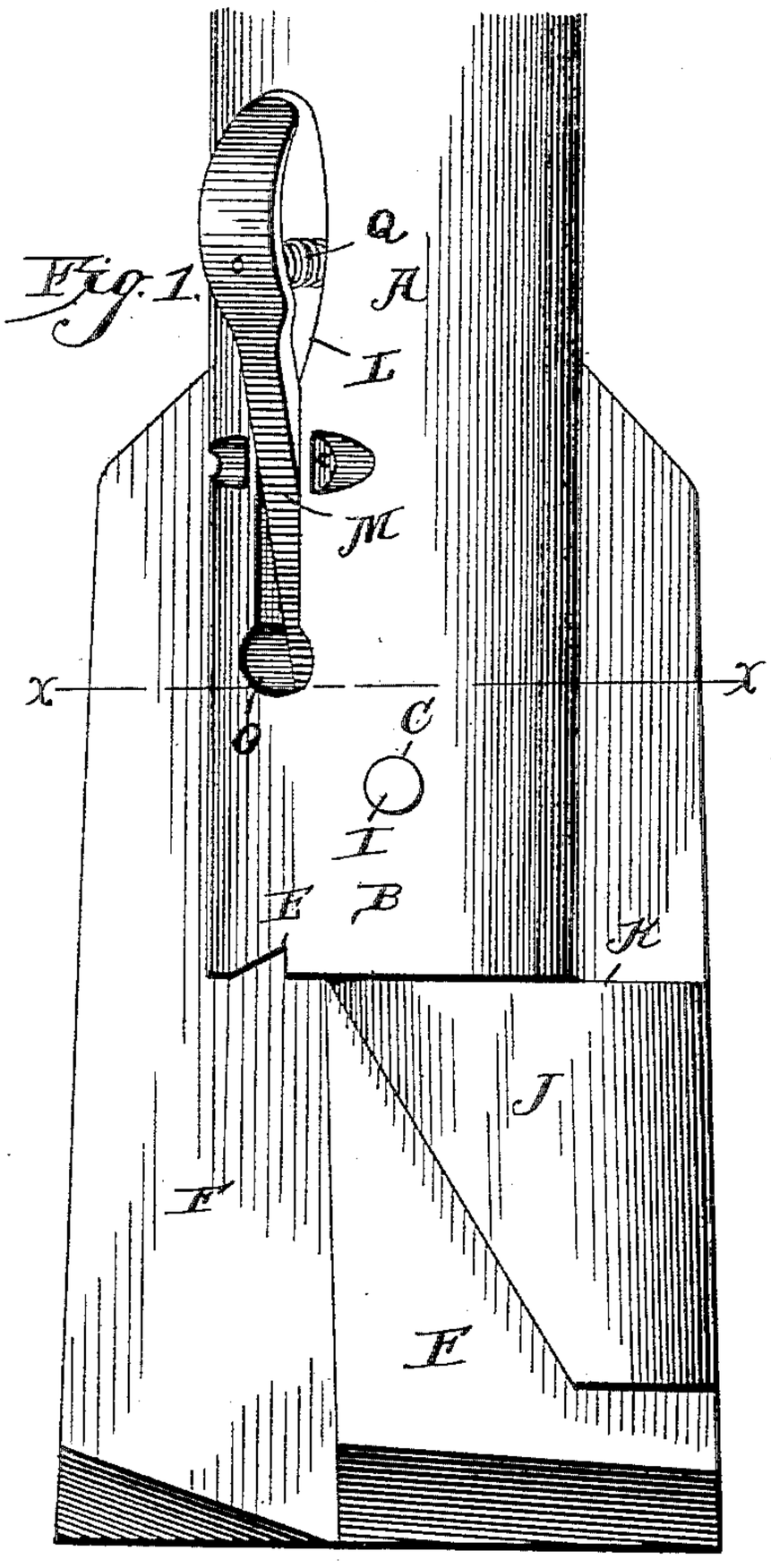


Fig. 2.

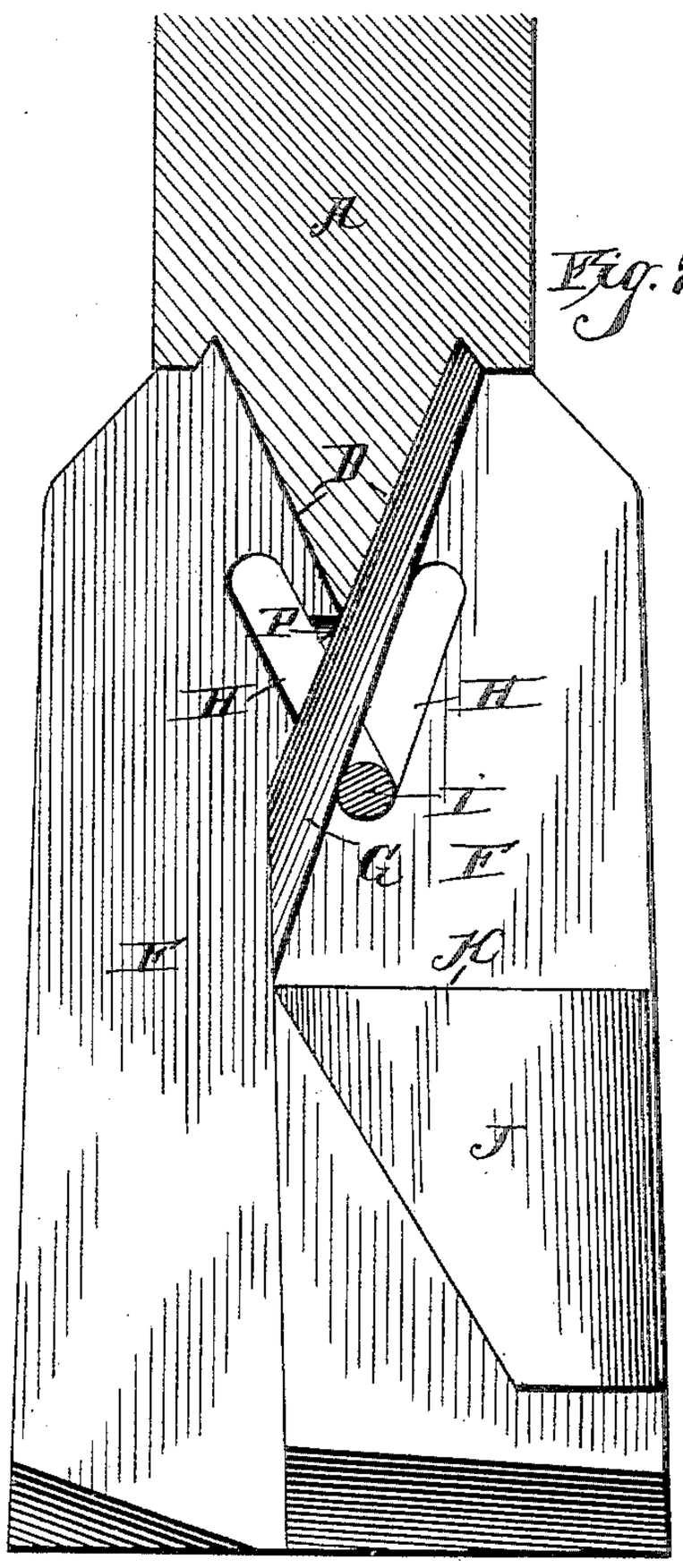


Fig. 3.

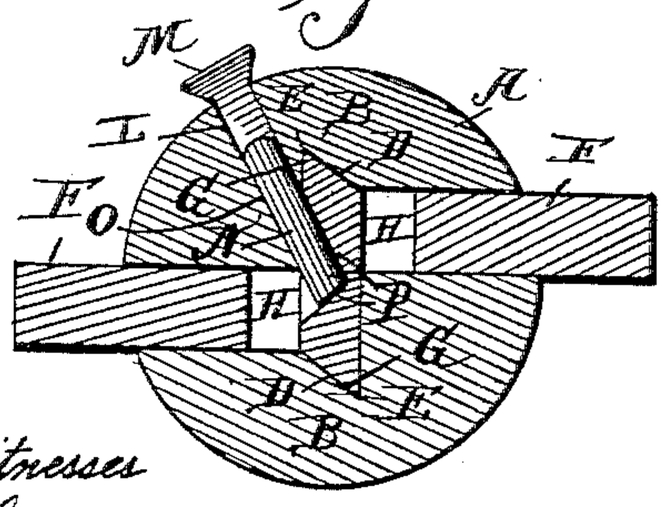
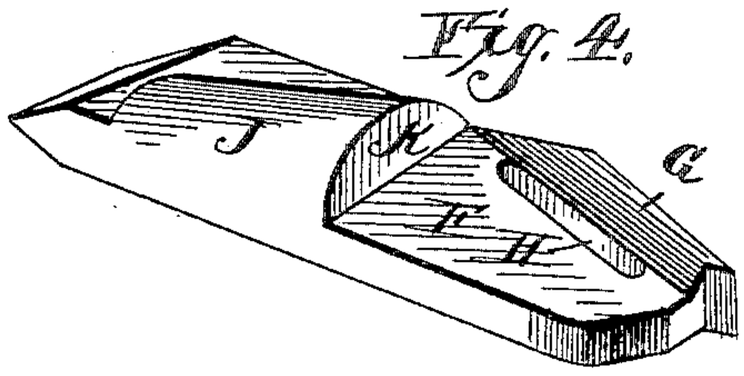


Fig. 4.



Witnesses

Henry J. Dieterich

R. N. Bishop.

Inventor

Tollef Herberg,

By his Attorneys.

Howson & Howson

UNITED STATES PATENT OFFICE.

TOLLEF HERBERG, OF HENDRUM, MINNESOTA.

EXPANDING DRILL-BLADE.

SPECIFICATION forming part of Letters Patent No. 414,411, dated November 5, 1889.

Application filed March 27, 1889. Serial No. 304,974. (No model.)

To all whom it may concern:

Be it known that I, TOLLEF HERBERG, a citizen of the United States, residing at Hendrum, in the county of Norman and State of Minnesota, have invented a new and useful Expanding Drill-Blade, of which the following is a specification.

My invention relates to improvements in expanding drill-blades; and it consists in certain novel features hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a side view of my improved device. Fig. 2 is a vertical section of the same. Fig. 3 is a horizontal section. Fig. 4 is a perspective view of one of the blades.

Referring to the drawings by letter, A designates the drill-rod, which may be either solid or tubular, as preferred, and has its lower end bifurcated, thereby providing the arms B, and through the said arms I form a horizontal perforation C, as shown. On their inner opposing sides the arms B are provided with the reversely-inclined shoulders D, and at the base of said shoulders with the grooves E, which extend the entire length of said shoulders and follow the outline thereof.

The drill-blades F are mounted between the arms B, and are provided with the inclined ribs G on their sides, at their upper ends, adapted to engage the grooves E and slide therein. The drill-blades are further provided with the inclined slots H near their upper ends, and the pin I, secured in the openings C in the drill-rod, passes through the said slots.

The drill-blades are provided on their outer sides with the projections J, having the abrupt shoulders K at their upper ends adapted to engage with the lower end of the drill-rod and thereby limit the upward movement of the blades, and the lower ends of the blades and of the offsets J are sharpened, so that as the drill-rod is rotated the blades will cut the ground, as will be readily understood.

The drill-rod is provided in its outer side, near its lower end, with a recess L, and a latch M is pivotally secured in said recess and has its lower end bent inward to form a hook N, which projects through an opening O in the drill-rod to engage a notch or notches P in the upper ends of the drill-blades. The upper end of the latch is projected normally outward, so that its lower end will be held in engagement with the drill-blades by a spring Q, arranged in the recess L and bearing against the latch. The upper end of the latch is of a convex form, as shown in the drawings, so that it will be easily operated by the lower end of the casing, as will be presently more particularly described.

The construction and arrangement of the parts of my device being thus made known, the operation of the same will, it is thought, be readily understood.

When the device is to be lowered to the bottom of a well or other opening, the latch is disengaged from the drill-blades, so as to allow the same to drop by reason of their weight. The ribs and grooves will direct the drill-blades inward, so that they will occupy less room, and consequently can be easily passed downward through the casing to the bottom of the well, while the pin I prevents the blades falling from the drill-rod. The device is then lowered in the casing, and when the drill-blades strike the bottom of the well they will be forced upward, and by reason of the inclination of the grooves and ribs will be directed outward and expanded. The drill-blades will be held in their expanded position by the latch automatically engaging the notches in their upper ends, as will be readily understood. When the drilling has been completed the drill is lifted from the well and the blades will be thrown inward, so as to pass easily up the casing in the following manner: As the drill-rod is raised, the convex end of the latch will be brought against the end of the casing, and will be thereby pressed inward, and the lower end of the latch is thereby withdrawn from engagement with the drill-blades, so that the same will be free to move. The blades after being released have a tendency to fall by reason of their weight, and this tendency will be accelerated by the upper ends of the blades striking against the end of the casing as the drill-rod is raised. The blades will thus be thrown inward and will pass easily through the casing.

It will be seen from the foregoing description that I have provided a very simple and efficient drill in which the blades will be securely locked in their expanded position, so

as to cut a large opening, and will be automatically released from their expanded position when the device is raised. The several parts of the device are all protected against injury and are simple in their construction.

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

1. The combination, with the drill-rod, of the drill-blades mounted therein and provided on their outer sides with the offsets J, having the abrupt shoulders K, adapted to impinge against the end of the drill-rod, and a latch mounted on the drill-rod and adapted to engage the drill-blades, as set forth.

2. The combination of the drill-rod provided at its lower end with the arms B, having the transverse perforations C and the inclined grooves E in their inner faces, the drill-blades arranged between the arms B and provided with the inclined slots H, and the inclined ribs G, engaging the grooves E, the pin inserted through the perforations C, and the slots H, and a latch mounted on the drill-rod and engaging the drill-blades, as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

TOLLEF HERBERG.

Witnesses:
A. L. GERNON,
THOMAS PEDERSON.