E. S. WINCHESTER.

Rock Drilling-Machine.

No. 159,242. Patented Jan. 26, 1875.

Fig. 1.

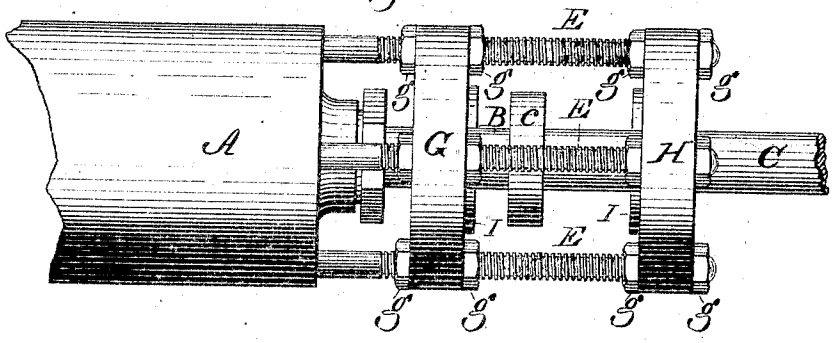


Fig. 2.

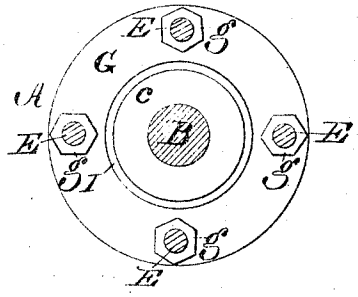
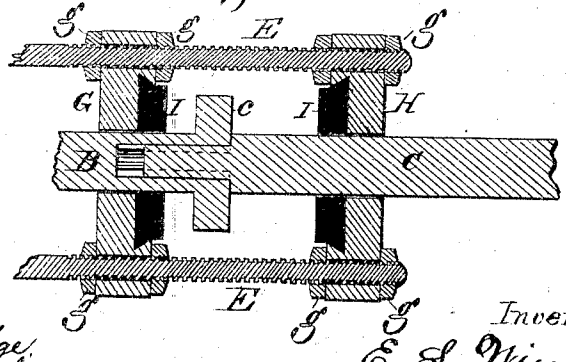


Fig. 3.



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UNITED STATES PATENT OFFICE.

EDWARD S. WINCHESTER, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN ROCK-DRILLING MACHINES.

Specification forming part of Letters Patent No. 159,242, dated January 26, 1875; application filed January 2, 1874.

To all whom it may concern:

Be it known that I, EDWARD S. WINCHESTER, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain Improvements in Rock-Drilling Machines, of which the following is a specification:

My invention relates to that class of drilling-machines in which the tool is attached to the end of a reciprocating piston-rod; and consists in the use, outside of the cylinder, of cushions to check the movement of the piston and tool, and in a peculiar manner of supporting and adjusting said cushions.

Figure 1 is a side view of a cylinder and piston with my improvement applied thereto; Fig. 2, a transverse section of the same on the line *x x*; and Fig. 3, a longitudinal central section of the same.

A represents the cylinder, in which the reciprocating piston is mounted; B, the piston-rod extending out through a stuffing-box on the head of the cylinder; and C, the tool or drill-rod attached to the end of the piston-rod, the above parts being all constructed and arranged as usual. To the end of the cylinder I secure four bolts or rods, E, extending forward, as shown, and on these rods I mount two plates, G and H, the former around the piston-rod and the latter in advance of the piston-rod, around the tool or drill-rod. In a recess in the outer face of the plate G I mount a central cushion of rubber, I, surrounding the piston-rod, and in the inner face of the plate H I mount a like cushion, surrounding the tool or drill rod, as shown. On the end of the piston-rod I form a head or enlargement, *e*, which, as the piston moves to and fro, comes in contact with first one cushion and then the other, the parts being so arranged that the contact of the head with the cushions occurs at the finish of the stroke.

In this way the movement of the piston in each direction is checked easily, and without any material jar or concussion, and the piston prevented from striking the ends of the cylinder under any circumstances.

By arranging the cushions outside of the cylinder free access to them is permitted, and they are kept free from exposure to oil and heat.

I am aware that it is not new to employ cushions to check the movement of the piston; but heretofore they have been placed within the cylinder, whereby they were exposed to the action of heat and of the lubricating-oil, by which, in conjunction with the pounding action of the piston, they were soon reduced to a viscid non-elastic mass, and rendered utterly useless. By my arrangement they are removed from exposure to these destructive influences, and caused to operate in a more satisfactory manner and for a great length of time.

In order that the cushions may be adjusted the plates in which they are mounted are secured by nuts *g*, mounted on the rods E, which are threaded, as shown, so that by turning the nuts the plates may be moved, as required. It is obvious, however, that the plates may be secured by other fastenings, that they may be supported otherwise than by the rods, and that the piston and cushions may be varied in form and arrangement, as circumstances render advisable, provided the cushions are outside of the cylinder and serve to check the movement of the piston or tool-rod. The cushions in the present instance are secured in the plates by being forced into and expanding within seats or recesses, which are enlarged toward the bottom, as shown in Fig. 3.

If preferred, the shoulder or head to strike the cushions may be formed on the tool or drill-rod instead of on the piston-rod.

In practice I construct the cylinder of several transverse sections, as in the patents heretofore granted to me, and extend the rods lengthwise through the same to the rear end of the cylinder, so that they serve to hold the sections together as well as to support the cushions.

It is obvious that instead of securing the cushions to the plates they may be secured to the piston-rod, and arranged to come in contact with the plates.

Having described my invention, what I claim is—

1. In combination with the cylinder and piston of a rock-drilling machine one or more cushions, arranged outside of the cylinder to check the movement of the piston, substantially as shown and described.

2. In combination, the cylinder and piston of a rock-drilling machine, a cushion or cushions, supported by the cylinder and arranged to check the movement of the piston-rod, substantially as shown.

3. The combination of the cylinder A, piston-rod B, rods E, plates G H, nuts *g* or equivalent fastening devices, and the cushions I, constructed and arranged substantially as described.

EDWARD S. WINCHESTER.

Witnesses:
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