E. S. WINCHESTER.

Rock-Drill Engines.

No. 152,540. Patented June 30, 1874.

Fig. 1.

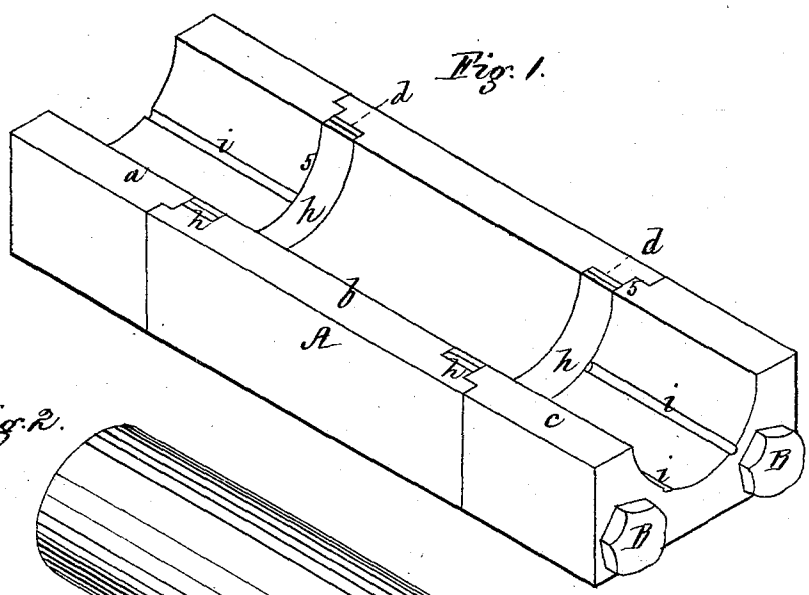


Fig. 2.

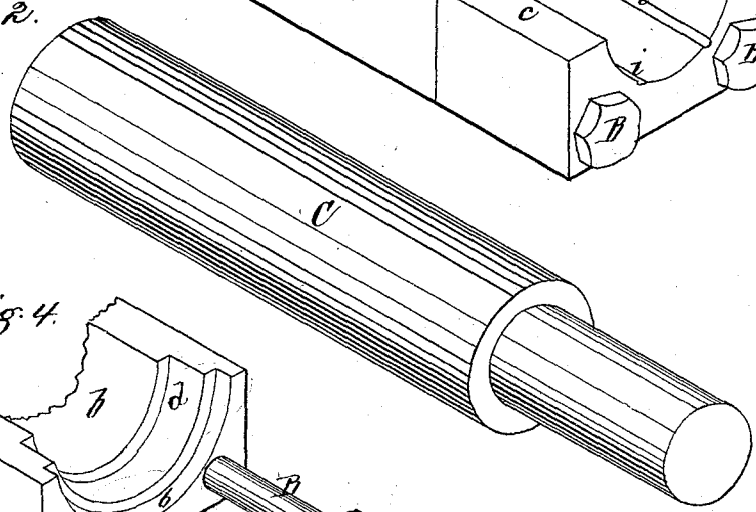


Fig. 4.

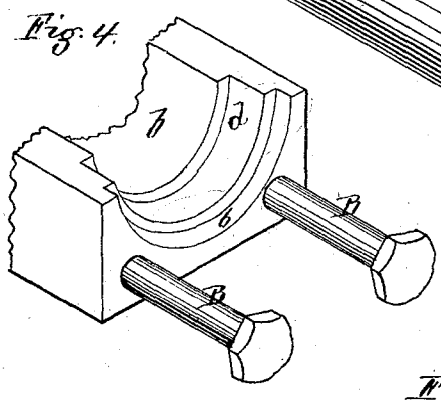
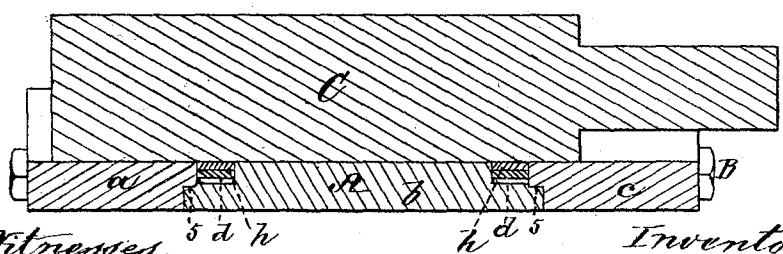


Fig. 3.



Witnesses,
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UNITED STATES PATENT OFFICE.

EDWARD S. WINCHESTER, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN ROCK-DRILL ENGINES.

Specification forming part of Letters Patent No. **152,540**, dated June 30, 1874; application filed Aprii 4, 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 the construction of Rock-Drill Engines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings making part of this specification, in which—

Figure 1 is a perspective view of a portion of a cylinder constructed in accordance with my invention, and representing the manner of applying the packing thereto. Fig. 2 is a perspective view of the piston and a portion of its rod. Fig. 3 is a longitudinal section through the center of the portion of the cylinder shown in Fig. 1, with the piston shown in Fig. 2 applied thereto. Fig. 4 is a perspective view of a portion of one of the sections of which the cylinder is composed.

My invention consists of a cylinder made in sections, fitted together in a novel manner, with recesses for the insertion of packing-rings formed at the joints between the sections; and further, in a groove or channel on the inside of the cylinder, to conduct the steam from the end of the piston to the packing-rings, as hereinafter more fully set forth.

My improvements have more especial reference to that class of engines used for rock-drills, steam-hammers, and the like, in which the piston is subjected to concussions, in consequence of the drill or hammer being connected direct to the piston. In this class of engines the concussion caused by the drill or hammer coming in contact with the material on which it is operating is transmitted directly to the piston, and it is, therefore, necessary that the piston itself should be made very long, so as to afford a long bearing-surface, to prevent the rapid wearing away of the surfaces, and keep it true and steady; and also that the packing-rings be inserted in grooves in the cylinder instead of in the piston, to protect them from injury by the continuous concussions to which the piston is subjected; and, also, that provision be made for conducting the steam alongside the elongated piston to the packing-rings.

To accomplish these objects I construct the engine as represented in the drawings, in which A represents a cylinder cut longitudinally through the center. This cylinder is composed of three sections, *a*, *b*, and *c*. The inner ends of the end sections *a c* are provided with projecting lips or flanges 5, which fit into corresponding grooves 6 in the outer ends of the middle section *b*, the several sections snugly fitting into or overlapping each other, by which construction they are prevented from separating laterally, while bolts B, passing through the entire length of the three sections, prevent their longitudinal separation, and the union of their surfaces is thus effected in such manner as to insure a tight joint, as required. The interior surface at both ends of the section *b* is recessed or turned out, in order that when the several sections are properly united and secured together, annular grooves *d* may be formed therein, of a width sufficient to receive the packing-rings *h* for preventing the escape of steam between the cylinder and the piston C, which is made of sufficient length to extend over both packing-rings in any position of the piston during any portion of its stroke. *i i* are channels cut in the inner surface of each of the outer sections *a c* of the cylinder, and extending to the packing, and down the sides of each of the grooves *d*, in which it is placed, the purpose of the channels being to allow the steam to pass under the packing to force it snugly up and around the piston, whereby all leakage between it and the cylinder is avoided.

This method of constructing the cylinder in sections, and making the joints at the points where the recesses for the packing are to be located, simplifies and cheapens its construction, as, by this plan, the joint for the union of the sections, and the recess for the packing-rings, can both be turned with ease in a lathe without removing the sections. The groove 6 for the joint, and the recess *d* for the packing, both being at the end of the section, can be got at with ease and facility by ordinary tools. With equal ease and facility the lips or flanges 5 can be formed on the other sections by simply turning off their outer surface in a lathe.

It is obvious that any number of sections

and of packing-rings may be used, but in all cases the length of the piston should be such that its ends will not pass the rings.

In this manner I am enabled to construct an engine that is especially adapted for use with rock-drills, steam-hammers, &c., and that will remain in order much longer than those heretofore in use, and which at the same time is very simple and cheap to construct.

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

1. A cylinder for engines, composed of a series of sections, united by means of the annular grooves and flanges, and having the grooves *d* for the packing-rings formed by turning out the end of the section or sections, as shown and described.

2. One or more channels, *i*, formed in the interior of the cylinder and extending to the packing, to allow of the passage of steam or air thereunder, substantially as and for the purpose set forth.

Witness my hand this 30th day of March, A. D. 1874.

EDWARD S. WINCHESTER.

In presence of—

P. E. TESCHEMACHER,

W. J. CAMBRIDGE.